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Contributions.

The Heat Test for Car Wheels.

ROANOKE, VA., Oct. 30, 1896.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The discussion now going on concerning heat tests for chilled iron car wheels is certain to be productive of good in that it will call the attention of many railroad mechanical officers and wheel makers to the importance of securing a wheel mixture that when used will produce wheels that will pass some final heat test, as well as the drop, chill and other tests.

It is wise, however, when investigating a complicated matter, such as this one of wheel mixtures, to bear in mind that there are many sides to the question and that it will not do to follow one line of investigation without considering what effect changes, which may be suggested as the result of such investigation, will have upon other equally essential qualities of the product.

It is admissible to assume that, to obtain uniform wheel mixtures, continuous chemical analyses similar to those made for the regulation of the products of blast furnaces, Bessemer and open-hearth steel mills, etc., will be found to be an absolute necessity. Such being the case, it will cost no more to use the results of these analyses to regulate results in other directions and obtain a better, all-round wheel.

We know that the presence of sulphur, phosphorus, silicon, manganese, carbon, etc., in different percentages produces red and cold shortness and affects the toughness, hardness and brittleness, strength, etc., of iron and steel. It is very probable that these ingredients have considerable influence on the failure of wheels by shelling out from sliding, to which cause a very large proportion of chilled wheel failures are due, especially on mountain railroads. Of course no one supposes that the wheels will not flatten if slid, but examination of large numbers of scrap wheels shows that there are numbers of wheels both of old and recent make that have been slid flat and not shelled or disintegrated by the intense local heat at the point of sliding, and large numbers of others that have shelled out as the result of small slid places say $\frac{1}{2}$ in. or more in diameter. This would indicate that certain mixtures will stand the intense local heating caused by sliding and yet not disintegrate so that subsequent rolling or pounding will break out the iron into shelled spots while other mixtures which make strong, good wheels, with deep chills and good fractures, seem to fail by shelling out at every small slid place. It may be that wheels that will stand a heat test such as the Altoona or Sacramento tests without cracking will also stand sliding without shelling out, but it may be the contrary, and the best mixture to prevent cracking from overheating due to brakes may be the worst for shelling out.

It looks as if it would be very interesting to take borings from near the rims of a large number of wheels that have slid and not shelled and from others that have slid and shelled, analyze these and compare these analyses by averages with the analyses of the irons that for a given pattern of wheel will stand the heat test best. We should be much nearer to knowing how to make perfect chilled wheels if this were done, and should there prove to be any relationship between the presence of some ingredient in certain proportion and the tendency to shell out after sliding, a great saving to railroad companies can be effected and the chilled wheel manufacture brought down to as scientific a process as making rails or boiler steel.

R. P. C. SANDERSON.

The Elevation of Rails on Curves.

CINCINNATI, Oct. 30, 1896.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have followed with considerable interest the discussion in your paper about the recommendation of the Roadmasters' Association in regard to curve elevation and the comments thereon by Professor Allen. It brings to mind the full consideration given to that question on the Pittsburgh, Cincinnati & St. Louis road in 1879-80.

The crookedness of the eastern part of that line, and the discomfort caused to passengers by the bad-riding curves, led to a very thorough investigation of the whole subject, which resulted in the use of spirals on all curves of three degrees or over, and a good deal of care and attention to the subject of elevation.

One of the greatest troubles we experienced was securing proper practice as to elevation of curves on the part of section foremen. We early found that it was a subject that could not be left to the Roadmasters' or section foremen themselves, and therefore the elevation of every curve was determined in the office after careful consideration of the local conditions. In order to prevent misunderstandings on the part of section foremen, stakes were placed at each curve, showing the elevation. Where spirals were used the stake at the point of curve was marked "Elevation, 0"; at the end of the spiral where the regular curve commenced, another stake was placed with the full elevation marked on it; where curves were compounded the change of the elevation was again indicated by a stake. The instructions were to gradually increase the elevation from the point of the spiral to the commencement of the regular curve.

On double-track portions of the line the elevation of the up-grade curve was reduced according to the grade, being in some cases not over half the elevation of the curve on the opposite track. This produced most excellent results, and of course reduced the resistance of freight trains without in any way interfering with the easy riding of passenger trains on the ascending grades.

Another point that soon developed was the importance of running in the grades before ballasting, and bringing the track to some uniformity in this respect. The undulations in the grade on curves were as much the cause of bad riding as improper elevation. In practice we found that where the required elevation exceeded six inches it was wise to reduce the speed of trains rather than increase the elevation.

Our experience did not indicate that high elevation was at all necessary. Uniform elevation, with the curves properly run in by a transit, with spiral ends, and with the profile properly adjusted, gave most excellent results with an elevation of 1 in. per degree up to 4 deg., $4\frac{1}{2}$ in. for 5 deg., $5\frac{1}{2}$ in. for 6 deg., and 6 in. for 7 deg. for descending grades. These made excellent riding curves, with engineers properly trained in the use of the air-brake on curves.

I certainly do not agree with some of your correspondents who seem to think that a uniform speed is maintained by passenger runners. A first-class passenger engineer should be able to handle his train so as to make the maximum speed required and at the same time run curves with ease and comfort to passengers. A little air applied to the train to steady it will always prevent disagreeable jars that are experienced on entering sharp curves and hard riding through them.

On high-speed lines like the Pennsylvania and the Baltimore & Ohio, between New York and Washington, exceptional elevations are probably required, as maximum speed must be maintained on all ordinary curves, but for lines where the schedule time of passenger trains does not average over 35 to 40 miles an hour, the elevations above referred to proved ample in practice.

The widening of gage on curves of over four degrees should not be overlooked, and in the cases above mentioned proved very satisfactory, especially in resistance of freight trains and the wear of the outer rail.

PAN HANDLE.

STAMFORD, Conn., Oct. 12.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Will not a train at a speed of 40 miles go faster around a one-degree curve than a ten? Yet, according to the table of the Roadmasters' Committee, the former curve will have but 1 in. elevation, while the latter receives 10. This is owing to the numerator of the formula remaining constant for a given velocity, while the denominator uniformly decreases with the constantly increasing curvature; the result being that the quotient will increase proportionally for every higher degree. Theoretically this is correct, but not practically.

A train running at its scheduled speed on a tangent goes on a curve of light degree; the speed, owing to resistance offered, is decreased, but not perceptibly. Further on a heavy curve is met with, and in rounding this the decrease is noticeable. Primarily this is due to the shortening of the radius of the curve. An engineer never gives the locomotive more steam in rounding a curve than he is using on the tangents; if anything it is lessened.

Taking into consideration this lessened speed, to properly obtain the elevation of a curve, it will be necessary to determine a co-efficient which will express it. This co-efficient should be incorporated into the formula. Then when this is applied in determining elevations, results will be obtained which are decreasing as the curvature increases.

Mr. F. S. Curtis, Chief Engineer of the New York, New Haven & Hartford, has devised a table of elevations from practical experiments, which give excellent

results. The table is here given for speeds of 40 and 50 miles per hour.

Elevation of Outer Rail in Inches and Fractions.

Degree of curve.	40 miles per hour.	50 miles per hour.
Deg. Min.	Inches.	Inches.
0 00	$\frac{1}{4}$	$\frac{1}{4}$
1 00	$\frac{1}{2}$	$\frac{1}{2}$
1 15	$\frac{3}{4}$	$\frac{3}{4}$
1 30	$1\frac{1}{4}$	$1\frac{1}{4}$
1 45	$2\frac{1}{4}$	$2\frac{1}{4}$
2 00	$2\frac{3}{4}$	$2\frac{3}{4}$
2 15	$3\frac{1}{4}$	$3\frac{1}{4}$
2 30	$4\frac{1}{4}$	$4\frac{1}{4}$
2 45	$5\frac{1}{4}$	$5\frac{1}{4}$
3 00	$6\frac{1}{4}$	$6\frac{1}{4}$
3 15	$7\frac{1}{4}$	$7\frac{1}{4}$
3 30	$8\frac{1}{4}$	$8\frac{1}{4}$
3 45	$9\frac{1}{4}$	$9\frac{1}{4}$
4 00	$10\frac{1}{4}$	$10\frac{1}{4}$
5 00	$12\frac{1}{4}$	$12\frac{1}{4}$
6 00	$14\frac{1}{4}$	$14\frac{1}{4}$
7 00	$16\frac{1}{4}$	$16\frac{1}{4}$
8 00	$18\frac{1}{4}$	$18\frac{1}{4}$

The writer has deduced a formula from this, which varies at the greatest about one-quarter of an inch from the elevations given in the table. Its use is recommended for speeds of 30 miles per hour or over. It is as follows:

(Degree of curve) $\times \frac{1}{2} + \frac{1}{10}$ velocity $\times (\frac{1}{32}$ degree of curve) = elevation in inches.

For example: What is the elevation of a two-degree curve for a speed of 50 miles per hour? Substituting in the formula we have:

$2 - \frac{1}{2} + 1\frac{1}{4} - \frac{2}{10} = 2\frac{3}{10}$ —or 2 $\frac{3}{10}$, taking the nearest eighth. The following table is computed from this formula:

Degree.	Elevation of the Outer Rail in Inches.	40 miles per hour.	50 miles.	60 miles.
1	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
2	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
3	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
4	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$
5	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{4}$
6	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$
7	$4\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{1}{4}$
8	$5\frac{1}{4}$	$5\frac{1}{4}$	$5\frac{1}{4}$	$5\frac{1}{4}$

In the last two tables the elevations, for a given speed, are greater in proportion for light-degree curves than they are for the heavier ones.

Curves should not be elevated over seven inches. When it is necessary to raise the outer rail a greater amount than this, the speed of the trains should be reduced to meet the elevation.

A rule which should be strictly adhered to is "always keep the inner rail to grade, and put all the elevation in the outer one."

In order that the best results may be attained, put the curve to a perfect line first, then elevate according to the degree. Use transitions between the different curves in a compound; and all curves of two degrees or over should be spiraled.

The amount of elevation should be regulated by existing conditions. On grades on a double-track road there will necessarily be more elevation in the descending than ascending tracks. Single track affords a problem for serious thought. In going down a grade high speeds are attained, while in ascending it trains will have their velocity reduced, according as the rise in feet per mile. The elevation in this case is usually determined by the traffic which predominates.

F. R. COATES.

Track Work and Tie Plates.

The Q & C Company, of Chicago, has recently published, in a pamphlet of 68 pages, the proceedings of a meeting held on an inspection train of the Illinois Central Railroad at Centralia, Ill., Nov. 12, 1895.

Mr. Benjamin Reece, Engineer of the Q & C Company, was invited to make an address on track work and tie plates, following which there were a general discussion on tie plates and a talk on track work, by Mr. J. F. Wallace, Chief Engineer of the Illinois Central. In publishing the report of this meeting 31 engravings have been added illustrating the text; most or perhaps all of these engravings being familiar to those who have read carefully the writings of Mr. Reece on tie plates.

In the course of his talk Mr. Reece spoke of the fact that he, while in the Road Department of the Lake Shore, had found that the best section men, as a rule, were slow; in other words, they did not get over the amount of ground the others did, but what they did was, in every case, thoroughly done. Instructions were given to the roadmasters to go with their section gangs, working them only at average speed and putting the track up as thoroughly as they knew how, by which means they could establish a basis to determine what distance ought to be covered in a day by the men working in that manner. From this a basis for a general average was secured, after which a report blank was prepared and filled out daily by the men, showing the number of hours and the amount of track work performed. The test was especially designed to ascertain the work required to bring the track up to summer standard, and in this a great variation in results was obtained. As a general proposition the men who apparently got over the most work in a day would, at the end of the season, have the poorest track. In this way the men who did their work in a hurried and loose manner were known and restrained, with the result that in a short time all were doing careful work and work which did not have to be done over again. It was also found that when once the men had become accustomed to working in this manner, they did not relapse into their old ways.

First-class track can only be secured by that unity and

course of vitrified brick, laid at right angles to the curb and, resting on a foundation of hydraulic cement concrete 9 in. deep. The paving extends 10 ft. from the bridge portals on either side. The approaches to the subways are graded and paved with whatever material is used on the particular street. In the subways, stone curbs are placed and Portland cement sidewalks laid. One or more catch basins are placed at the lowest points in the subways, to provide for drainage, which discharge into the city sewers. Water pipes, electric conduits and sewers, which on account of the depression at the subway are brought too near the surface, are carried back of the abutments and through the embankment. The

approximately equal sections, the splices being covered with 7-in. \times $\frac{3}{8}$ -in. plates on each side.

The top chords of the girders are made up of two 6-in. \times 6-in. \times $\frac{3}{8}$ -in. angles, and five 16-in. \times $\frac{3}{8}$ -in. cover plates, the angles being spliced at the tangent points of the curves at each end and covered with 5 $\frac{1}{2}$ -in. \times $\frac{3}{8}$ -in. plates. The first cover plate starts at the end of each girder upon the lower chord, leads up, forming the end posts, is bent around at each end and is spliced below the second cover plate, a distance of 28 ft. each side of the center of the girder. The second cover plate is 58 ft. 6 in. long, covering the splice of the first plate 15 in. at each end; the third cover plate is 49 $\frac{1}{2}$ ft. long, the

At the shops the bridges are given one coat of refined raw linseed oil, and after erection the ironwork is cleaned and given two heavy coats of bridge paint. All the material used in the bridges is open-hearth steel.

Railroad Terminal Stations.*

BY MR. E. K. TURNER.

Terminal stations are of two general classes, those for the accommodation of passenger traffic and those for freight. The subject is so extensive, that, in the present paper, the writer will confine himself to the consideration of those of the first class. . . . With the increase

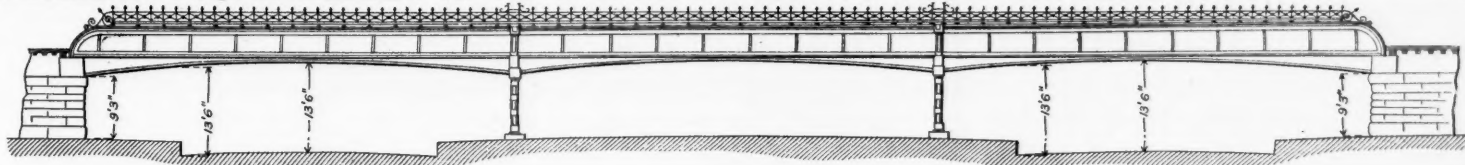


Fig. 2—Elevation of the Bridge at Garfield Boulevard—Track Elevation in Chicago.

abutments rest on concrete foundations varying in depth from 3 to 6 ft., depending upon the material encountered, the concrete being brought to within 6 in. of the surface; upon this foundation the stone is laid. The abutments are built of hard limestone cut to dimensions at the quarry; the abutments, back wall and coping are rock-faced, while the bridge seats are dressed.

Fig. 2 shows the elevation of the subway at Fifty-fifth street (Garfield Boulevard). This differs from the other subways in that it is a three-span bridge, with ornamented iron work. The other subway bridges are not ornamented and in the majority of cases are single span. In this instance there are two driveways, one at either side.

Fig. 4 shows portions of the iron work for a 66-ft. clear span bridge. Where six tracks are carried, the two middle tracks are 14 ft. center to center, all other tracks being spaced 13 ft. center to center. Where the distance between the faces of abutments is 66 ft. no intermediate column supports are used, and the girders measure 70 ft. from end to end.

The bridges are all of the plate-girder type with solid floors made of 59 12-in. I-beams, weighing 32 lbs. per lineal foot, spaced 13 $\frac{1}{8}$ in. center to center and covered with a continuous sheet of $\frac{3}{8}$ -in. steel plate. The plate girders are so spaced that they are each in the center between adjoining tracks. All girders are of the same sectional area and detail, so that at any time additional tracks may be provided and added to the bridges without re-inforcement or change in the existing work. The girders are all five feet deep over the chord angles, with rounded corners at the ends, the radius of the curve,

fourth 41 ft. and the fifth 30 $\frac{1}{2}$ ft. The bottom chord is made up of two 6-in. \times 6-in. \times $\frac{3}{8}$ -in. chord angles, of one 21-in. \times $\frac{3}{8}$ -in. cover plate 70 ft. long, and of four cover plates 16 in. \times $\frac{3}{8}$ -in.; the first plate is 58 $\frac{1}{2}$ ft. long, the second 49 $\frac{1}{2}$ ft., the third 41 ft. and the fifth 30 $\frac{1}{2}$ ft. All rivets in the girders are $\frac{3}{8}$ -in., and over the bed plates at each end they are counter sunk and driven flush. All rivets in the attachments between the floor beams and the larger plates are $\frac{3}{4}$ -in., and where the floor beams are connected to the girders $\frac{3}{8}$ -in. rivets are used. The 70 ft. girders are constructed so as to have a camber of $\frac{3}{8}$ in. in the center.

The floor system used on these bridges is entirely new, and is the design of Mr. Clark. No stringers are used and the whole forms a waterproof floor, which, while stiff, is still sufficiently elastic. All parts act together under a load instead of the various members acting separately, as in the old construction.

The weight of a four-track, 70-ft. girder bridge with the design of floor shown in Fig. 3, is 200 tons, and of a six-track bridge of the same length, 300 tons.

The floor beams are cut to a level with a cold saw, and are riveted in the shop to 9-in. \times $\frac{1}{2}$ -in. hanger plates by means of two 3 $\frac{1}{2}$ -in. \times 3 $\frac{1}{2}$ -in. \times $\frac{3}{8}$ -in. angles using four $\frac{3}{4}$ -in. rivets each. The hanger plates are riveted, in the field, to the webs of the girders with five $\frac{3}{8}$ -in. rivets each and to the 21 in. cover plates of the bottom chord with three $\frac{3}{8}$ -in. rivets each, through the 9-in. \times $\frac{1}{2}$ -in. bent plates. The 9-in. floor cover plates are dressed to leave a seam not more than $\frac{1}{8}$ in. open, and are connected on their under side by 5-in. by $\frac{3}{8}$ -in. batten plates riveted to the flanges of the floor beams; the cover plates

in population and changes in its distribution in and around the cities, and with the growth of traffic on the railroads, has come the imperative need of better terminals, and within the last few years many of the most important railroads have rearranged or relocated their terminal passenger stations.

The passenger movement, so far as it concerns terminal stations, is composed of three classes: Through or long distance, suburban or short distance, and excursions or irregular travel. . . . The conditions governing the movements of the three classes of passengers noted, with their baggage and appurtenances, are very different, and the accommodations, which it is necessary to provide for them, vary widely.

The long distance passengers have a large amount of baggage, some of which can be taken directly to or from the train, but a large proportion requires provision for storage, and all requires provision for handling while at the station, for the reception and delivery of the baggage and room for storage of checks and for the clerical work necessary for the proper recording and accounting. Passengers of this class usually visit the city at long intervals, and upon arrival must go to their destination by some conveyance, either carriage or street car, so that the location of the station is of less importance to them than to those of the second class. Its arrangement as to comfort of waiting-rooms and convenience of baggage rooms is of greater importance. Many passengers of this class wish to take the cars of some railroad other than those of the road upon which they arrive. If the trains of both railroads are in the same station, with convenient provision for the prompt transfer of the passengers and their baggage from one to the other, their comfort and convenience are served in the best manner. This result is reached in many of the "union stations" which have become common within the last few years.

The second class noted above, containing the greatest proportion of passengers using the terminal station, including all passengers whose work calls them to the city daily, covering the large number whose place of business is in the city and residence is outside, have very

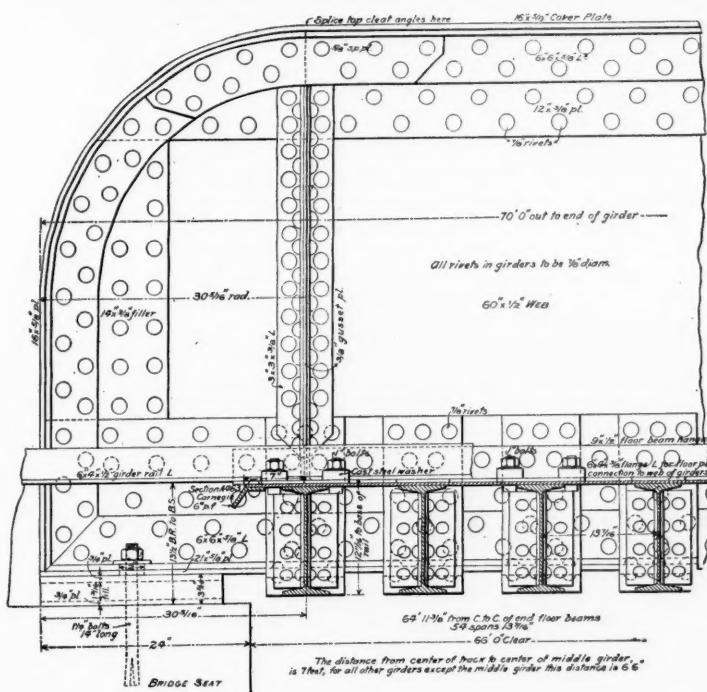


Fig. 4.—Partial Elevation and Section of 66-Ft. Clear Span Bridge—Track Elevation in Chicago.

30 $\frac{1}{8}$ in. being central over the end floor beams. The girders rest on 21-in. \times 21-in. \times $\frac{3}{8}$ -in. wall plates made up of $\frac{3}{4}$ -in. top and bottom plates with fillers between, the top plate being planed true; these plates, in turn rest on the abutments and are carefully bedded in cement. The whole is bolted to the masonry with 1 $\frac{1}{4}$ -in. anchor bolts, split and driven over steel wedges and cast in the bolt holds in the stone with Portland cement. The anchor bolts fit the holes in the wall plates closely, but the holes in the girders are two inches in diameter to provide for expansion, both transversely as well as longitudinally. All girders have $\frac{3}{8}$ -in. web plates re-inforced at the top chord by two 12-in. \times $\frac{3}{8}$ -in. side plates and at the bottom chord by two 17-in. \times $\frac{3}{8}$ -in. side plates, all side plates being continuous from end to end without splice. The web plates are in three

are also connected to the web plate of the girders by means of 6-in. \times 4-in. \times $\frac{3}{8}$ -in. flange angles. The seams, where the floor plates are joined, are filled with hot asphaltum before painting.

The rails, which weigh 80 lbs. per yard, are placed on $\frac{3}{8}$ -in. rail plates, one over the center of each floor beam. The plates are 16 $\frac{1}{2}$ in. long, alternating 10 in. and 6 in. in width; the 10-in. plates are bolted with four 1-in. bolts passing through the cover-rail plate, and a cast-steel rail clip, which fits closely to the foot of the rail. The 6-in. rail plates are merely bearing plates and are without bolts. On the outside of the rail and resting upon the same rail plates are 6-in. \times 4-in. \times $\frac{3}{8}$ -in. angle iron guard rails, which are riveted through the rail and floor plate to the flanges of the floor beams, with four $\frac{3}{8}$ -in. rivets at each intersection.

different requirements. They do not need such provision for baggage or waiting-rooms. They reach the station just before the time of departure of their trains and hurry from their trains immediately on arrival. Inside the station, convenient ways for the quick ingress and egress are the primary requirements, with a good system of running and dispatching trains, and conspicuous and plain indicators showing destination and starting time of trains.

To this class the location of the station is of the greatest importance. For them, on general principles, the station should be as near the business center as possible. If this class of business is to be attracted to the railroad, the facilities offered and cost of transportation must be as favorable as those of competing lines. The majority of this class are people with small incomes, to whom the addition of a street-car fare daily to the steam-car fare, is a serious, if not impossible, expense,

* Extracts from a paper read before the New England Association of Railroad Superintendents Oct. 12.

hence the necessity of bringing them as near to their places of business in the city as possible, so that it will not be necessary to use the street cars. The location of the station is the governing point with this class in determining the location of their homes and upon the choice of transportation line to be used in passing between their homes and places of business.

For the third class noted above, the location of the terminal station does not play so important a part, neither does the arrangement of waiting-rooms and baggage-rooms. The main features needed are large space and free egress from the trains for the excursion crowds. Care is needed also to have the train indicators plain and conspicuous and proper provision for preventing crowds from going to the wrong train.

The location of a terminal station is for the above reasons of the greatest importance to the railroad, for without passengers there is no need of a station. It is of importance also to the city in which it is located and to the other cities and towns upon the line, especially to those at which the homes of the people, whose work is in the city, are located. The growth and prosperity of such places depend almost entirely upon the accommodation furnished by the railroad and the location of the terminal station is one of the most important elements in the accommodation.

At first the steam railroads took the larger share of suburban traffic . . . but the heavy passenger traffic and the absence of branch feeders to the steam railroads, have enabled the electric railroads to develop and extend the street systems, and by the superior facilities offered, to bring such competition as to seriously affect the earnings of the suburban steam lines. To meet this competition successfully the steam railroads must have better facilities than were called for by the small traffic of former times. A terminal station near the center of business has become absolutely necessary for such lines.

One of the first cities to feel the effect of the change of location of its population was London. Within the last few years the old City, that part ruled over by the Lord Mayor, has become almost depopulated so far as regular residents are concerned. The people who work in the city live in the suburbs, furnishing to the transportation companies an immense traffic. To accommodate this business, most of the steam lines having termini in London have built extensions into the City, often at cost which seemed out of proportion to the benefits gained, but almost without exception the outlay has proved wise, the increase in earnings yielding a good return upon the outlay. The Charing Cross Railway may be cited as an example; it is 4½ miles long and cost \$3,500,000 per mile. This was built to give the Southeastern Railway access to the business center of London.

The North London Railway is an example of a railroad built almost exclusively for suburban business. It is 12 miles long. Its terminal station is on Liverpool Street, facing Broad Street, and is known as the Broad Street Station. This railroad cost \$1,600,000 per mile. It has eight tracks in the station, four tracks for about eight miles and two on the remaining distance. About 750 trains enter or leave this station daily. In 1894 the number of passengers carried, exclusive of season and time tickets, was 34,498,000. There were received in addition \$29,400 from season tickets, which would bring the total number of passengers up to at least 37,000,000.

In comparison with this number it may be interesting to show the number carried by the Boston railroads during the same year:

	Total.	To and from Boston.
Boston & Albany.....	12,152,000	7,546,000
New York, New Haven & Hartford..	44,448,000	19,831,000
New England.....	8,116,000	3,426,000
Boston & Maine.....	33,385,000	21,654,000
Fitchburg.....	7,117,000	4,055,000

Or arranging these figures in groups according to the railroads which use the North Station and those which will use the South Station, as follows:

	Total.	To and from Boston.
North.....	40,448,000	25,709,000
South.....	64,532,000	24,803,000

The number of trains run by the railroads at present is as follows:

North Station, per day.....	574
South Station.....	678

As an example of what the suburban cheap traffic is worth, the North London Railway in the year noted, 1894, earned from passengers £39,415, and from freight £147,149, paying a dividend on its ordinary shares of 7½ per cent., which must all have been earned, as the English law forbids dividends being paid except from actual earnings.

After the location of a terminal station has been determined, the element next in importance is the arrangement of the buildings and tracks.

Of course, each one has its own conditions, varying often from others in such manner that precedents already established must be widely departed from in order to reach the best results. In general, the station should be so designed that baggage, express goods and milk, with such other articles as may be received or delivered at the station, shall be handled either below or above the level of the tracks; in most cases it must be below such level. There are several reasons why such an arrangement is desirable. The movement of passengers and of trucks conveying baggage on different levels makes it safer and easier for people to make such movements as are necessary or desirable about the station. The risk of injury to passengers is much lessened. Less platform room is required for the same amount of business. The movement of both passengers and goods can be made promptly. On the score of economy of space and cost of land, it is better to have all work pertaining to baggage and goods under the head-house and trainshed below the level of the tracks, thus making two uses of the ground area, quite an important saving where land has such value as is generally the case near the business centers of cities. A much smaller area will be required to provide suitable space for the traffic than if used only once. Such an arrangement renders it impossible to give more and better space to carriages and teams receiving and delivering baggage and goods, also to separate the receiving and delivering points in the station of the various classes of traffic, and to reach a systematic handling of such traffic, which is usually impossible when it is all handled at the same point.

With the tracks above the level of the surrounding streets, passages can be made from the tracks to the streets by the most direct course, enabling passengers arriving on trains to disperse much more easily and quickly than if they are obliged to all pass along the platform and out through the headhouse. At times of extraordinary movement of passengers this is quite an important element in their safe and prompt movement. Objection is sometimes made to such an arrangement, that it renders it necessary for passengers to go up or down stairs and that elevators are needed for the use of passengers. With careful planning, inclined ways can generally be provided which can be used by such passengers as object to climbing stairs.

Placing the tracks at a higher level also admits of

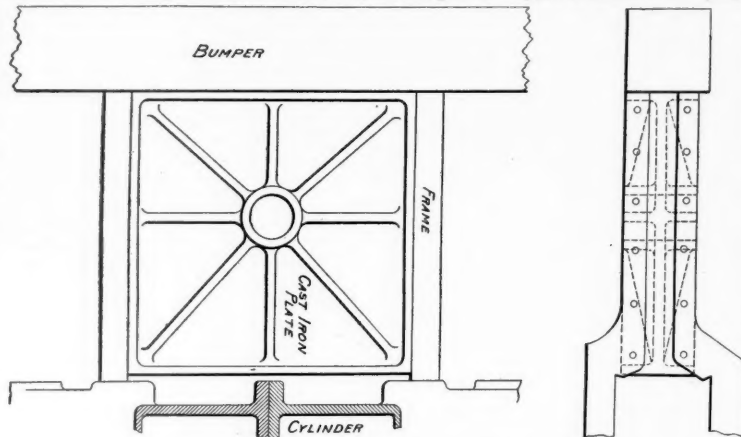
crossing above the streets near the station, avoiding the necessity of crossings at grade or of expensive changes of streets, which in important cities carry with them not only the great direct expense of making the changes, but also a greater indirect expense in the detrimental effect on the value of property. It is also possible generally to obtain better architectural effect with the tracks above the street level, as is well shown in many of the stations recently built in London and various German cities and notably in the terminal stations in Philadelphia.

With the baggage and such merchandise as is handled at the station, below the tracks, out of the way of passengers, it is possible to so plan the rooms devoted to the use of passengers as to reach the best and most convenient arrangement.

The rooms most used and those to which particular attention should be given are the outward reception or waiting rooms. Passengers wait here for trains, often for a long time and the rooms should be made light and comfortable, special attention being given to ventilation. The waiting-rooms, usually on one side, face the street or approach, on the other, open into the trainhouse; the latter, especially in stormy weather, is dark and does not afford much light to the waiting-rooms, so that where possible, the waiting-rooms should be lighted from the top. This arrangement also admits of providing good ventilation. Seats should be so made as to be of comfortable form and at the same time easily cleaned, offering few places on or under them for lodgement of dust and dirt, and no parts in which it can be concealed. The finish and coloring of the rooms should be light and cheerful. In placing the seats, account should be taken of the movement of people through the room and the seats so placed as to interfere as little as possible with the usual current of movement, for the comfort of those occupying the seats and those passing through. Provision should be made for easy access to ticket offices, water closets, and other rooms devoted to the use of passengers from the waiting-rooms.

A liberal provision should be made for artificial light, with no dark corners. Doorways and passages should be made wide, with doors swinging outward from the waiting-room, and both ways in such passages as are used by passengers going to and from trains.

Generally at terminal stations space is allowed for carriages and cabs to stand while waiting for inward trains. In many of the English stations a wide space between platforms at which long-distance trains arrive, in the train house, is devoted to this use, so that passen-



Front Frame Bracing—Baltimore & Ohio Consolidation Locomotive.

gers leaving the cars can go directly across the platform into the cab. The English custom of carrying the greater part of the luggage with the passenger in the car makes it possible to use such an arrangement to better advantage than would be the case in this country.

There is one practical objection to providing room for carriages under cover. Without the greatest care and sometimes even with it, it is impossible to keep such places sweet and free from odors. Everywhere around a station that horses stand, the sunshine and rain should have free access.

In designing a trainhouse, if the cost can be ignored, a roof of large clear span is desirable; but as short spans with a row of posts between each pair of tracks gives the greatest economy in construction, this plan has been followed in many of the trainhouses recently built. With the improvements in the manufacture of glass, it has become possible to make a large portion of the roof covering transparent, thus giving good light to the interior of the train shed. The greatest objection to the method of construction noted, that is, short spans with posts, is the trouble experienced in taking care of snow and the difficulty of keeping the roof tight.

Platforms between tracks should be of some hard material, which can be easily kept clean. The surface of platforms should be on the same level as the top of rails, so that baggage trucks and other wheeled vehicles can pass from one platform to another upon the same level, thus doing away with the need of moving such vehicles on the same platform with passengers taking or leaving trains. This construction is also safer for passengers, especially for those who get or off moving trains.

In organizing the train service in a terminal station, the writer believes that unless there is some very serious practical objection, inward long distance trains should always enter on one side of the train house and outward long-distance trains depart from the other side, although such arrangement may cause more crossing of trains on tracks outside the trainhouse. All provision for the accommodation of passengers can be made more easily, if such movement of trains is strictly adhered to and it renders unnecessary the mingling and crowding of passengers going in both directions and the passing of incoming passengers through the waiting-rooms, where such movement always results in discomfort and inconvenience to those waiting to take trains.

The middle tracks, those between the inward and outward tracks devoted to long distance trains, should be used for short distance, suburban trains. These suburban trains can be unloaded and loaded on the same tracks, that is, enter the station, discharge the inward passengers, take on outward passengers without switching, another engine backing on to the train and hauling it out, relieving the engine which brought the train in. This engine can follow the train out, going to some place where provision has been made for turning and taking water. It can there be made ready for its next trip.

This arrangement admits of the movement of suburban trains without switching or useless movement, saving much expense and wear of rolling stock and locomotives. If such trains are made up with the baggage car on the end of the train toward the outer end of the train house and kept in this order, it adds to the convenience of both passengers and station men at the terminal and at way stations. At way stations, the baggage car can be stopped always at the same spot, both inward and outward, which at stations having few employees would relieve them of much movement backward and forward to attend to baggage, express goods and letters or parcels brought in the baggage car. As the switching of cars and the cost of repairs incident to such switching is a large item in the expense of operation, such an arrangement would make quite a saving in the cost of operation.

The tracks in train-houses are usually arranged in pairs, with a platform between each pair of tracks. For suburban trains it might be well in some places to lay three tracks together, in order to allow the locomotives to pass around its trains without drawing the train entirely out of the station.

For tracks on which inward trains having a large amount of baggage and express goods arrive, it might be well to change the above arrangement by placing a narrow platform between the tracks of a pair, and using this platform for baggage and express trucks, thus keeping the regular platform free for the movement of passengers, avoiding what in many stations is a serious inconvenience.

The modern application of interlocking switches and signals, with the improved methods of handling both switches and signals, together with the good track appliances and material now obtainable, makes it possible to do many things safely and promptly with moving trains that would a few years ago have been impossible, so that the crossing of trains from one track to another is now admissible at stations where the trains of several railroads entering the same train-house, removing the principal objection to the arrangement of trains noted—that is, inward trains on one side, outward trains on the other, and suburban trains in the middle.

Many different arrangements of tracks at terminal stations have been suggested, among them one which has merit where width enough can be obtained to admit of its use, that is, a loop on which trains can continue their movement onward, instead of backing or being hauled out. This arrangement requires a considerable width of yard to admit of its being carried out, with the rolling

stock in ordinary use on steam railroads, and in most cases the expense of providing the land necessary would prohibit its adoption. A good example of this form of terminal is now being built in Chicago, where several elevated railroads meet. It is estimated that over fifteen hundred trains per day will pass around this loop. It may be remarked that this loop is being built over streets and not on private property.

It may be well to suggest that it is possible to have a terminal station too large. Anything beyond the room required for active use is not only wasted, but is positively objectionable. It increases the distance of those parts of the station between which passengers and employees must pass. It furnishes room for standing cars which should be stored elsewhere, and leads to carelessness and lack of neatness in the care and policing of the station. Therefore, while a proper provision for growth of business should be made care should be used not to carry this to extreme.

Whatever may be the arrangement of a terminal station, success in operation can only be reached by good management and close attention to details by those in authority, with strict discipline and promptness on the part of the employees.

Pittsburgh Consolidation Locomotive for the Baltimore & Ohio.

We illustrate one of the 20 class E-12 consolidation locomotives, built for the Baltimore & Ohio railroad, from designs prepared by Mr. Harvey Middleton, General Superintendent of Motive Power of that road, by the Pittsburgh Locomotive Works. These engines are very powerful with 22-in. x 28-in. cylinders, and are designed for freight service on the mountain divisions of the road.

There has been placed ahead of the cylinders and back of the bumper, filling up the space entirely between frames, a heavy casting for the purpose of squaring up the frame, as in the case of the foot-board on the American type of engines. This is done to take the racking strain off from the cylinders. The accompanying diagram shows this casting in detail. The cylinders are provided with heavy vertical ribs, located at the four corners of the saddle, extending from the flange under the smokebox to the lower flange at the bottom of the bed plate and filleting into the side of the top tongue of the frame. On heavy locomotives there is apt to be considerable breaking through the saddle of the cylinders at this point, owing to the cylinders being the principal connection between the boiler and the frame. It is believed that these heavy ribs will act as braces to withstand the shock, thereby saving the cylinders.

The lower end of guide yoke, to which the guides are attached, is bolted to the upper portion, to facilitate repairs. Ample brackets are provided for securing the guides to the guide yoke. These have heavy lips which fit over the sides of the guides, for holding the same squarely to the guide yoke. On the steam chest is a combination vacuum and automatic steam chest relief valve. The spring in this valve is set a few pounds above the boiler pressure, so that in case the engine is reversed in going down hill, the cylinders will be relieved of the accumulating pressure.

The boiler is an extended wagon-top type, built with crown bars, with numerous washout plugs for cleaning the crown sheet and flues. The space between the tubes is $\frac{3}{4}$ in. instead of $\frac{5}{8}$ in., which is the usual practice. In putting this boiler together the sheets were securely bolted together and all the rivet holes reamed and the outer edges of the holes slightly chamfered. The thickness of the sheets in the firebox is somewhat greater than usual, being $\frac{7}{16}$ in. for the crown, $\frac{5}{16}$ in. for the side and door and $\frac{1}{2}$ in. for the tube sheet. The firebox is secured to the frame by means of heavy clamps, instead of the usual suspended links.

The side rods have solid forged oil cups. The driver brakes are of the latest American design, using push cylinder, which does away with the packing around the piston rod. The Leach sander is used on these engines. The front bumper drawhead is made unusually long, for the protection of the pilot in coupling up. The cab is well lighted and provided with ample ventilation by means of a hinged door in the roof and the hinging of the sash in the rear of the cab, thereby inducing a current and carrying off the hot air.

These locomotives are provided with two steam gages, one in the forward part of the cab and the other on the rearhead of the boiler. The tanks are made of heavy sheets, the top, inside and bottom being $\frac{3}{8}$ in., and the outside plates $\frac{1}{2}$ in. They have a long transverse filling hole, thereby increasing the range for stopping at the pen stocks. They are equipped also with the Master Me-

phlet, nor the discussion that has followed, makes this as plain as it ought to be.

Attention so far has been paid chiefly to the large-car problem as a transportation problem. The discussion has run mainly to dimensions, capacity, cubic contents, material, weight, framing, and other particulars of freight-car construction, having more or less clearly in view the adoption of that standard, if one can be found, that will reduce the cost of transportation per ton-mile to the lowest possible amount, and having regard also to the due preservation of rolling stock and permanent way. In its recommendations the committee deals chiefly with mechanical topics, such as a standard car body for roofed cars, the withdrawal of small cars from general interchange and the limitations of capacity to 70,000 or 80,000 lbs. This particular "large-car problem" has not lacked and will not lack for consideration. The active thoughts of expert master car builders and superintendents of motive power have been devoted to it, while, after all, it is a comparatively simple problem.

Not so the large-car question as a traffic question. This problem has received much less attention than the other one, is much more intricate, and is much further from solution. The committee's report reveals the confusion on which the issue is buried, the astonishing diversities of opinion that prevail, and the slight effort that has been put forth toward a rational and satisfactory settlement. And yet the traffic question is the vital one.

at a given rate is of course cheaper to the shipper than a small carload. In such cases the given carload rate is not the actual rate at all, but the larger the car the lower the rate. Out of these circumstances has grown the building of extra large cars for the handling of light and bulky freight.

"The demand for these extra large cars was created, and is still being stimulated," says the report, "by the provision in the official classification establishing minimum carload weights of light and bulky articles, for which shippers must pay whether the car offered by the carrier is a large car or a small one. As the shipper who gets a small car knows that he will have to pay more per 100 lbs., or per package, than the one who gets a large car, it is quite reasonable and natural that all shippers of light and bulky freight should demand the largest cars to be had. This demand will, doubtless, continue until the classification is changed."

This outline of the problem suggests the evils of the situation, but hardly does more than suggest them. They need to be emphasized. Reading between the lines that have just been quoted, discriminations as between individuals, violations of the sound principles of classification, the thrusting of needless burdens and expense on the mechanical departments, the sacrifice of proper economy in the utilization of old cars and the construction of new ones, and, in general, unbusiness-like methods as regards both shippers and the transportation companies, may be found quite too easily. The committee's conclusion that these evils "will doubtless continue until the classification is changed" in one way or another is undoubtedly correct.

The wrongs endured by shippers on one hand, and the losses sustained by carriers on the other, because of the present system, are most clearly set forth in the letter from Mr. A. C. Bird, General Traffic Manager of the Chicago, Milwaukee & St. Paul. The New York Railroad Club or some other organization would do well to take up the large-car problem *de novo*, from the traffic standpoint, with this particular statement of facts and conclusions for a text.

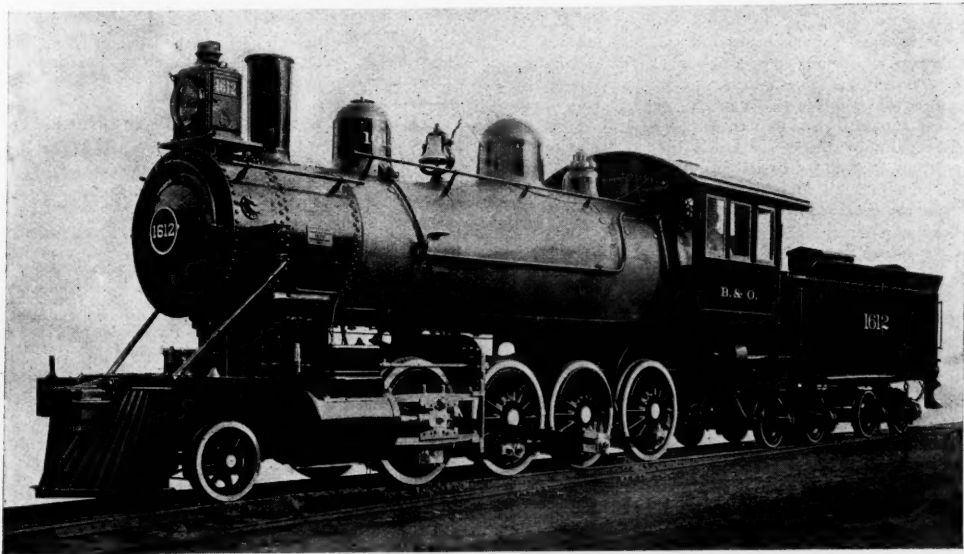
With regard to shippers, Mr. Bird points out that the system of minimum weights, with cars of varying size, "has created unjust discriminations between individuals and communities that would not be tolerated were the facts and effects fully realized. A shipper of bulky freight cannot know what rate he must pay per hundred pounds or per package until he gets his car. A manufacturer gets a large car to-day and a smaller car to-morrow. The uncertainty prevents him from conducting his business with precision. In some instances where bulky freight is involved, the actual rate per 100 lbs. charged for a small car is 100 per cent. greater than that which is charged for a larger one. So long as cars are of different dimensions a carrier cannot serve all shippers or all communities under present methods. The practice of minimum weights is injurious in all cases where the property carried is of such bulky nature as to prevent the loading of the prescribed minimum in ordinary cars."

As regards the railroads, Mr. Bird holds that the minimum weight system "has resulted in a loss which is doubtless equal to all that has been gained by improved construction. It has given impetus to the construction of cars by private individuals to accommodate their particular business, and such private cars are used, and mileage is paid thereon, when the carriers' own cars are standing idle. It has made it necessary for the operating department to build cars of extraordinary cubic measurements, and to haul them long distances empty for some particular shipment, when the sidetracks at the shipping point are full of idle cars that have been discounted by an unwise classification. The system would not have an injurious effect if cars were all of the same dimensions, but the progress made by the operating department in the construction of new cars has been neutralized by the very natural demand of shippers that they be furnished with large cars, and so far as this particular class of business is concerned, modern cars of large dimensions have displaced all ordinary cars, and made them practically useless."

That "the tendency to build large cars" is bad from every point of view is the well-known opinion of Mr. J. N. Barr, Superintendent of Motive Power of the Chicago, Milwaukee & St. Paul, and in a sentence Mr. Barr shows that he thinks that the Traffic Department holds the key to the situation. "If the Traffic Department's rates were not of such a character as to encourage and almost compel the construction of unduly large cars, we should not have any difficulty of this kind," he says.

Mr. G. W. Rhodes, Superintendent of Motive Power of the Chicago, Burlington & Quincy, puts the responsibility in the same place. "If the railroad," he remarks, "makes a minimum load that will not go into an ordinary car it certainly is offering a premium to some one to build a car that will carry the minimum load." And again: "The attempt to limit the construction of large cars will prove of no avail until it is made unprofitable for any one to build them."

A significant illumination of the absurdities of the system of minimums is furnished by Mr. F. V. Davis, General Freight Agent of the Chicago & West Michigan. Mr. Davis agrees with those already mentioned in the opinion that "the building of large cars has been forced upon the railroads by the necessity of the situation for cars that will enable the shipper to load the minimum weight of certain kinds of freight for which the railroads require pay for transporting," and then he goes on to show that in many instances the greatest possible carloads are far below the established minimums. A list of



Consolidation Locomotive—Baltimore & Ohio.

chanic steps, and with hand holds on all four corners of the tank. The forward and back draft castings of the tender are united by long through rods instead of depending upon the frame wholly.

The general dimensions of these engines are as follows:

Type.....	Consolidation
Fuel.....	Bituminous coal
Base of iron.....	11 ft. 8½ in.
Total weight of engine in working order.....	168,000 lbs.
" " " on drivers.....	155,000 lbs.
Driving wheelbase of engine.....	15 ft. 4 in.
Total.....	23 ft. 8 in.
" " " and tender.....	32 ft. 6 in.
Height from rail to top of stack.....	14 ft. 7¾ in.
Cylinders, diameter and stroke.....	22 in. × 28 in.
Piston rods.....	Steel, 4 in. diameter
Type of boiler.....	Extended wagon top
Diameter of boiler.....	64 in.
" " back head.....	73½ in.
Crown sheet.....	Supported by crownbars
Staybolts, 1 in. diameter, spaced 4 in. from center to center.....	246
Number of tubes.....	294
Diameter of tubes.....	2½ in.
Length of tubes over tubesheet.....	14 ft. 9½ in.
" firebox inside.....	115 in.
Brick arch.....	Supported on studs
Working pressure.....	180 lbs.
Kind of grates.....	Cast iron, rocking
Heating surface in tubes.....	2,132 sq. ft.
" " " firebox.....	181.2
Total heating surface.....	2,313.2
Grate surface.....	32.7
Diameter of driving wheels outside of tires.....	54 in.
" and length of journals.....	8½ in. × 10 in.
" of engine truck wheels.....	5 in. × 8 in.
" and length of journals.....	5 in. × 8½ in.
Type of tank.....	Level top
Water capacity of tank.....	4,000 U. S. gals.
Fuel.....	280 cu. ft.
Weight of tender, with fuel and water.....	83,300 lbs.
Type of brakes.....	Westinghouse-American

Some of the Questions of Large Cars.

BY E. W. JUDD.

The Case Stated.—The comprehensive and permanently valuable report submitted to the New York Railroad Club at the February meeting by the exceedingly able Committee on Large Cars (see *Railroad Gazette*, March 6, page 159, and March 27, page 213) begins with the statement that the committee was appointed to consider "the so-called large-car problem." Perhaps a clearer conception of the points at issue, and greater progress toward a satisfactory solution, would have been reached if the subject of the investigation had been thought of and set forth as plural instead of singular. Not merely a "problem," but "problems," are involved.

Two entirely distinct large-car problems exist side by side. One of them is a traffic question and the other a transportation question. Neither the committee's report nor the accompanying documents in the published pam-

Let the "large-car problem" as a traffic question be solved in accordance with principles of common sense and equity—on which basis alone a permanent settlement can be reached—and the large-car problem as a transportation question will take care of itself, just as the problems of economical sizes of locomotive, and of rail sections take care of themselves. The mechanical men may be depended on to speedily work out their "sums." The traffic men, unfortunately, have hardly begun on theirs. Let us look into the complexities of the situation, and then search for a way to unravel the tangle.

Two categorical questions will perhaps help forward the inquiry. What is the traffic manager's large car problem? What makes his problem peculiarly difficult? The problem is, in brief, how to get adequate, but just and reasonable, revenue from the transportation of full loads of light bulky freight, such as exhausts the cubic capacity of cars without reaching the limit of their weight capacity. The exceeding difficulty of the problem is due to the establishment in the past of arbitrary minimum carload weights, which, though far below the tonnage capacity of all modern cars, are yet more or less in excess of the actual carload weights of many kinds of bulky freight, even though the freight be loaded to the full cubic capacity of the cars.

In order to show more clearly the confusion and the perplexities that now prevail, and the opinions of experts upon this subject, from all of which it will appear that the prevailing system must be seriously at fault, let us bring together some of the remarks on the traffic problem that are scattered here and there throughout the New York Railroad Club's pamphlet.

The committee of which Mr. W. W. Wheatly was chairman, though obviously considering the traffic man's large-car problem as of secondary rather than of primary importance, shows very plainly what it is that makes the problem exceptionally puzzling. In their efforts to get adequate compensation for light, bulky freight in carload lots the traffic men have in a measure disregarded the object of freight classification, which is "to maintain such a definite relation between the various classes of property offered for transportation that no preference shall be given to one over another," and have established minimum carloads, which in many cases are not what ordinary box cars will hold, but two or three times what can be put into them. By this means a nominal rating of third class or fifth class may actually be raised to two times third class or ten times fifth class, as the case may be. With a minimum weight in each instance in excess of actual weight, an extra big carload

40 articles, by no means insignificant, is presented, merely to "give some idea" of the extent to which actual average weights that can be loaded into 34-ft. box cars fall below the prescribed minimum weights of the official classification. The ten most extraordinary instances of discrepancy are as follows, the figures being for pounds:

	Average actual weight.	Classification, minimum weight.
Grain cradles.....	2,000	20,000
Cutters.....	3,625	20,000
Fanning mills.....	4,085	24,000
Household goods.....	5,300	12,000
Baskets.....	6,750	12,000
Wheelbarrows.....	6,750	20,000
Mattresses, woven wire.....	6,750	16,000
Trees in bulk.....	10,000	20,000
Burial cases.....	10,242	24,000
Furniture, all kinds.....	10,274	12,000

"This situation," Mr. Davis adds, "has made it imperative on the part of the shipper to demand cars with a capacity that will permit of the loading of 12,000 lbs. of furniture, and other articles to the prescribed minimum." The demand for large cars, no matter how many small ones may be lying idle, is "imperative" because it does not seem practicable to make any very radical changes in the reduction of the present minima, since to do so would be to make the traffic unremunerative at the present rates, while to lower the minimum and advance the rates would not afford any relief to the shipper." Here is a singularly frank intimation of an untenable reason for the maintenance of a system that "has created unjust discriminations between individuals and communities," namely, that the roads need the money that the system brings in. The additional suggestion that shippers would find no relief in the substitution for the present system of impossible minima, and nominally low, but actually uncertain and variable rates, of a new system of known and definite even if nominally higher rates, opens a broad field for inquiry, and one that will be entered into further on.

That the traffic problem is the vital one appears plainly enough from a report that was made last November by Chairman Ripley, of the Western Classification Committee. Pointing out, first, that the question as to the most economical size of car boxes is "purely a mechanical and operating problem," Mr. Ripley added: "It is incumbent on the traffic department to provide such minimum weights and rules as will insure the full use of equipment, without discrimination against any part of it." The issue is one that progressive traffic men cannot avoid, for "large cars, at least until recently, have been demanded and, in many cases, hauled long distances to load light and bulky freight, while at the same time smaller cars have been left idle on the sidetracks at stations ordering the large cars," and no argument is needed to prove that this is a wasteful way of doing business.

In connection with this report a tabular exhibit was submitted which showed among other facts the capacity of 34-ft. cars for each of 39 articles, light and heavy, taken at random, and the present minimum weights of the same in the Western classification. This statement was taken as the text for an exceedingly interesting and weighty paragraph in the report made in December by the Committee on Dimensions of Cars, appointed by the Central Traffic Association and the Western Freight Association, of which committee William Buchanan was chairman. The committee said:

"These figures show that there are many items of freight that cannot be loaded in a modern car so as to give a loading of one-half the capacity of the car, and the minimum weights at which such items are billed show reasons for a strong inducement to exist in some localities for building cars of a greater bulk-carrying capacity so as to get a weight of freight in the car approximately equal to what must be paid for. For instance, there is one case [barrels] where 20,000 lbs. is the minimum weight billed, while the capacity of the car is only 13,022 lbs., and another case [moss] where 20,000 lbs. is the minimum weight billed, while the car has but 12,070 lbs. capacity. Numerous other cases show facts tending in the same direction, and it is the belief of your committee that if these inducements to build cars of greater cubic contents did not exist, but rather that the minimum weights were fixed so that the modern car as built and owned by railroad companies would have the same chance as the larger and weaker cars which railroad companies are asked to haul in their trains, the whole difficulty encountered by the association would be met, and the building of such larger and weaker cars, which are a menace to the safety of the railroad company's trains, would cease."

From this statement it appears that, in the opinion of these eminent mechanical officers, the "whole difficulty" of the large-car question is one of rates, so that the first thing to be done is for the traffic men to readjust their rates, or, what amounts to the same thing, to reconstruct their system of minimum weights.

In the discussion of the subject by the New York Railroad Club the responsibility of the traffic department received some thoughtful though only casual attention. Mr. C. M. Mendenhall, Superintendent of Motive Power of the Philadelphia, Wilmington & Baltimore, suggested that the views of Messrs. Goddard and Bird were particularly instructive, that the traffic departments had been out of touch with the transportation departments, and that with minimum weights leased on cubic capacity "the probabilities are that the differences in the sizes of box cars would not be as much of a disturbing element as they are to-day." The advice given by Mr. A. E. Mitchell, Superintendent of Motive Power of the Erie, will be shown hereafter in another connection.

Mr. W. W. Wheatly, Car Accountant of the West Shore, suggested that as the preliminary for the adoption of "a standard box car for general interchange service," the traffic people should "change their minimum weights in the classification." And finally Mr. C. W. Bradley, General Superintendent of the West Shore, asserted that "nothing causes more trouble or loss of money than the variation in the carrying capacity of cars"; that "the large-capacity car, operated with small cars, makes a great deal of trouble with the shippers, and through them with the traffic department. The shippers soon found out that there was some advantage in large cars, and wanted them, and as soon as the traffic department found out that the large cars could be used as a factor in competition, they began to utilize the big cars as soliciting agents, and so the trouble has increased."

These opinions, explicit as they are, drawn from so many sources, and the views of so many representative men in various departments of the service, can hardly need summarizing. They show plainly enough that a large-car problem as a traffic problem most certainly exists; that it is an exceedingly grave problem; that it presses for solution in advance of further efforts to solve the large-car problem as a problem in mechanical construction; that it concerns both railroads and shippers, the former in their revenue and their expenditures, the latter in their mercantile profits and their right to be treated by the carriers justly, without discrimination; that the difficulties are due to the present system of minimum weights for light and bulky freight; that these minima are numerous enough and high enough to make the embarrassments of shippers and carriers alike not trivial but serious; and, in detail, as regards the transportation companies, that the prevailing system occasions constant loss by hampering and in many instances rendering altogether impossible the use of existing equipment, and by thrusting continually new burdens of construction and expense upon the mechanical departments; and, as regards the public, that it violates all of the sound principles of classification, of fixity in rates according to classification, and of publicity in rates, by making actual charges for transportation depend not on classification and tariffs, but on the varying sizes of cars furnished by the carriers; that it permits of the distribution of cars by favoritism, and thereby entails all of the evils of unjust discrimination, notwithstanding uniform classifications and published tariffs; that it makes it impossible for shippers to determine before loading their merchandise what the freight rates will be; and that it perpetuates thoroughly unbusiness-like methods, giving carriers pay for what they do not carry, and requiring shippers to pay for what they do not ship, instead of putting this branch of the transportation industry on the permanent and equitable basis of all other branches of transportation and of all other industries, in which compensation is rendered for services actually performed, no more and no less.

In view of the foregoing quotations from the many authorities referred to, it is of interest that in the 75 pages of the New York Railroad Club's pamphlet, only one voice is raised in defense of the present system or practice of minima. Even this voice is not very emphatic. Mr. C. E. Gill, Chairman of the Official Classification Committee, in a letter asserts that "the minimum carload weights in effect under the various existing classifications are, as a rule, based upon fair averages of the actual weights of the various articles that can be loaded in what may fairly be considered ordinary or standard-sized cars," and that the adjustment is "more generally satisfactory" than the different adjustments recommended by the large car committee, as set forth hereafter, would be. But Mr. Gill's conclusions with regard to "fair averages of actual weights," and "ordinary cars," and minimum carloads, "as a rule," are obviously vague in comparison with the definite and positive statements of losses to carriers and injustice to shippers that have been quoted, and even Mr. Gill admits that the Official Classification Committee has been for five years studying how "to overcome the disparities complained of," so that the opinion that serious evils exist and a prompt and adequate remedy is demanded may be regarded as unanimous.

(TO BE CONTINUED.)

Track and Track Joints; Construction, Maintenance and Bonding.

BY M. K. BOWEN, Superintendent, Chicago City Railway Co.

Wearing of the Rail.—The life of a rail is measured by the wearing out of the head, and less than 12 per cent. is worn away before we sell the old rail for scrap, hence the deduction that the point of contact between the wheel and the rail, in other words, the bearing and wearing part of the track, is the most important consideration. . . . Take first a conical wheel running on a rail the surface of which is level. Referring to Fig. 1, we note that the rail and wheel make contact only at the point shown at *a*. This is the state of affairs when the rail and wheel are new. In a few months, if we again examine our wheel and rail, we will observe that the wheel is badly worn next to the flange, while the inner edge of the head of the rail has flattened to a considerable extent and worn down. Both the wheel and the rail are doing their best to come to a common bearing surface, but it is quite plain that the rate of wear must be enormous at first, for the whole weight of the car is brought to bear upon a very small surface.

Fig. 2 shows the section of a rail now in use on the

State Street cable line, Chicago, the height of the head being $1\frac{1}{2}$ in. The first rail put in had a head $\frac{3}{4}$ in. high; this was increased to 1 in. and later to $1\frac{1}{2}$ in.; it is beveled to conform with the bevel of the car wheel for two-thirds of its section from the gage line across the head. . . . The experience of the Chicago City Railway Company, who first tried this form of head, has been that it saved wear of both rails and wheels, increasing their life by about 35 per cent., as near as can be determined.

Fig. 3 shows a section of a new and an old car wheel which indicates clearly the manner in which the tread of the wheel will wear if used on a rail with no bevel. The record of car-miles of this wheel is not known, but no doubt a great amount of energy was lost before it had worn down to its most economical shape.

Fig. 4 shows a rail taken from State Street track after eight years' wear, during which time 8,000,000 car wheels passed over it.

Fig. 5 shows a rail taken out after eleven years' wear, but should have been taken out three years previous. The true rate of wear cannot be found, as the flange of the wheel had begun to run on the flange of the rail long before it was taken out. The dotted lines show the shape of the rail when it was taken out, showing the wear due almost entirely to wagon traffic.

Joint Construction.—I come now to what has been heretofore the weakest part of track construction, namely, joints. I have used for the past year a

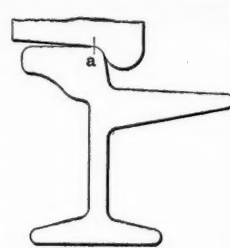


Fig. 1.—Bearing of Beveled Wheel Tread on Flat Rail Head.

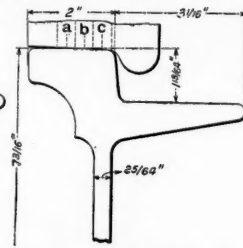


Fig. 2.—Rail Beveled to Conform with Bevel of the Car Wheel.

cast-welded joint. This has been found to give perfect satisfaction; it is strong and substantial, as has been proved by its holding under the extreme changes in temperature for which Chicago is noted. Seventeen thousand joints were put in in 1895 and of these only 154 joints were lost. The joint in comparative tests has been shown to be far stronger than the rail itself, and such breakages as have occurred were due to a flaw in the metal. The metal cast around the joint has eight times the cross-section area that the rail has. Hence, considering steel as four times as strong as cast iron, the joint is twice as strong as the rail. It has been found in some cases where this joint was used at crossings with other tracks, the tracks were apt to be pulled out of shape through the changes of temperature. To overcome this, the joint nearest the crossing should be anchored in a substantial manner.

The method of making the joint is as follows: The rails at the joint are scraped and brightened, a cast-iron mould is placed around the joint, making a tight fit; into this the molten iron, 25 per cent. scrap, 25 per cent. soft and 50 per cent. hard silicon pig is poured; the metal in contact with the mould begins to cool and forms a crust, while the interior remains molten. This crust continues to cool and at the same time contracts, forcing the molten metal strongly toward the center, which makes a solid and rigid joint. The top or bearing part of the ball of the rail is afterward filed off perfectly level so that it is very difficult to detect a joint by riding over it or looking for it. Upon breaking a joint which has been well cast, three spots will usually be found where amalgamation has taken place between the rail and cast portion—one on each side of the web, and the other on the bottom. These spots are from $1\frac{1}{2}$ in. to 2 in. in diameter.

There has been some discussion as to its being a bond for carrying electric current. I cannot recommend it with certainty, as there are occasional joints which I have taken off where no amalgamation has taken place whatsoever, thus destroying the effect as a bond of all joints in that line of track. To overcome this difficulty I have adopted the plan of bonding all joints. However, future experiments and care in the casting of joints may develop their efficiency as a bond.

Maintenance.—Upon organization depends the successful maintenance of the track, and one which I find gives the greatest efficiency is this: The system is divided up into sections, each consisting of 13 miles of double track. Each section is put in charge of a working foreman, who is to keep and maintain and repair as cheap as possible, and who is held directly responsible for the condition of the track at all times and for the tools of the company. All tools which need repairing are sent to the main storeroom, where they are exchanged for others in good condition. All new tools and material required are obtained from the main storeroom.

The question as to the right time to reconstruct or repair a track is one of the greatest importance, as it often involves the expenditure of thousands of dollars. The question to be solved is—am I losing money by not rebuilding my tracks? Should I have rebuilt them two or three years ago, or should I have waited a year or two longer? No doubt many of you have been confronted with just such a question as this and worried over it for days and nights, knowing that the decision meant the expenditure of many dollars for better or worse.

The task of solving this question was brought before me not long ago concerning the State Street cable track, which had reached a deplorable condition. Taking the Track Master with me, we rode over the line and, as street-railroad men often do, guessed that it was time to rebuild the track. This involved a very large expenditure, and it would be an expensive guess unless correct, so to ease my conscience and make sure of my guess I had run over the line a car weighing 8,665 lbs. attached behind a grip car by means of a recording spring balance called a dynamometer. This test car was then run over a track newly made at the same speed as over the old line; the dynamometer showed that it took 13.75 lbs. more pull per ton to haul cars over the old line than

*Abstract of paper presented at the St. Louis meeting of the American Street Railway Association, Oct. 20-23, 1896.

over the new. The average speed of cars on this street is 12 miles per hour. The excess horse-power required to haul one ton was .44, and the excess cost of hauling one ton one hour was 0.9 of a cent. The number of tons hauled one mile per year on this track was 45,147,537, and the time required to haul one ton one mile was five minutes; and 45,147,537 tons hauled at a given speed for five minutes is equal in work done to 3,762,000 tons hauled at the same speed for one hour; 3,762,295 multiplied by 0.9 of a cent equals \$33,860, which is the excess cost per year for hauling cars on account of bad track. It is estimated that the new track with cast joints will last 12 years, and as there will be no low joints the drawbar pull will not increase much until the rail is worn down sufficiently to allow the wheel to run on the flange, so the annual saving will be nearly \$33,108, during the life of the rail, and the total saving will be \$397,276, which in twelve years will pay principal and interest on \$298,444, which is the amount we could profitably expend in repairs. The actual cost of rebuilding this track was \$61,670.

Power Ratings Taken Automatically.—This caused me to think up some scheme by means of which dynamometer or power ratings could be taken and automatically traced on paper, showing the condition of the track at all points, showing faults of gage, level or joints; showing faults and excess power in consequence of faults, side by side, thus placing a value on faults; and then instead of representing faults and excess power in inches or foot pounds, make the instrument show them in dollars and cents per ton of load when capitalized, which would show, multiplied by the ton miles on any road tested, the amount that should be expended on track reconstruction, or rebuilding, with accuracy and certainty and put a stop to expensive guessing. It will also prove of value in checking up a piece of track built by contract before final estimate. The apparatus I devised for this purpose is what is called an Indicator Car. A description of the construction and method of working might be of interest to not a few, for I do not know of another in use by a street-railroad company, and found only one other (although very dissimilar) in existence on a steam road, after I had the plans of mine finished.

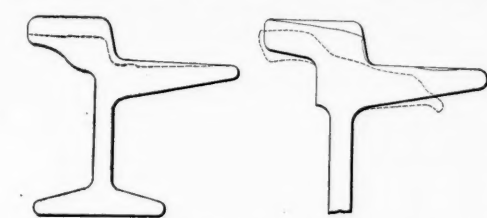


Fig. 4.—Wear of Rail After Eight Years' Service. Fig. 5.—Wear of Rail After Eleven Years' Service

The results shown by it are high and low rails, low joints, gage, drawbar pull and the variation of the track level (refer to Figs. 6 and 7). Each one of these results is automatically plotted on paper 18 in. wide. The car consists of a platform 8 ft. x 10 ft., mounted on a single truck, no springs being used. Midway between the two end axles is one which is fitted with wheels which record defects of joints or gage. After use and calibration of instrument it will be more valuable and the dynamometer will not be required, as any man using this car constantly will become so accustomed to the value of defects that a glance at the profile will tell him the money he may, with judgment, spend for rebuilding a track or repairing it.

The Dynamometer.—The dynamometer consists of two drawbars, one at each end of the car, and extending beneath the platform to within a distance of about one foot of each other. Between the two adjacent ends of the drawbars a spring is placed; and the amount of pull required to draw the car along the track in either direction is recorded by a recording arm, which is connected to the spring with a wire. The apparatus for showing the variation in the level of the rails is mounted on the platform and consists of two cups of mercury (having a connection between them by means of a pipe) and into which dip two plungers connected to a recording arm. The paper on which the record is taken unwinds at a uniform speed of 1 ft. per 1,000 ft. of track. The car weighs 3,865 lbs.; it is fastened to an ordinary car, which is drawn over the tracks by horses (or any motor car) made to go at as even a speed as possible. The results shown by a recent test trip are very interesting to compare.

Fig. 6 is from an old track. The joints are uncast, spread far apart, and the rails are low at each joint; this is distinctly brought out by the record. The gage is also uneven. It would appear from the record that the rails spread at each joint. The dynamometer pull is very unsteady, showing the effect of low joints and uneven gage.

Fig. 7 is a record from a new track. Here we can observe hardly any joints or variations in gage, and the dynamometer pull is more steady. Occasionally high points are observed, but they are due more to unsteadiness of speed. A person riding on this track will not be able to detect any joints. This track has the cast-welded joint previously mentioned. We find from the data obtained by use of this car that we could afford to expend \$7,383 per mile to repair the old track. The estimated cost of repairing this track, leveling and casting new joints is \$1,740 per mile.

Discussion.

Mr. ROBERT MCCULLOCH: Here in St. Louis we have one piece of track which is 13 miles long and all welded together, the most of it being 60-ft. rail. We have not an ounce of copper bond of any kind on the entire track. We have made tests of all sorts, with delicate instruments, graded to the thousandth part of a volt, tested as long and as short lengths as possible, sometimes a mile and sometimes a single joint, and have found in most instances that the carrying capacity of the joint was greater than that of the rail at any other place. We have no necessity for bonding, our contact being perfect at the extreme ends of the rail. I do not believe it is necessary to bond a welded track. These tracks were all cast welded.

In reply to many questions which were asked, Mr. Bowen brought out the following additional points in regard to cast welded joints:

The loss of the joints which parted on account of con-

traction was due to very cold weather in mid-winter. With the first cold snap, the contraction of the rails pulled 154 joints apart. The joints were repaired, and since then they have gone through the summer the same as the other joints. The joints were made in midsummer during the night hours. When the rails pull apart, in all probability, it ruptures the bond. If it does, we put in a new bond. In regard to trouble with rails after they are bonded giving the car a waving motion, Mr. Bowen said that the trouble probably comes from the casting. "You will find, as you put your mould on to cast the joint, that the rails have contact at the ball and not at the flange. If you are not careful, the rail will do two things—it will go out and it will go up, on account of the majority of the iron being underneath the rail. The contraction in cooling will push it up and push it out. In order to prevent that, we put a clamp on the rail when casting it and push it in a quarter of an inch."

"In repairing a rail with a space of 3 in. we saw a piece of rail and cut it in and recast around the entire two joints in that case. We simply bond the track after we cast the joints, using a long bond around the weld. In welding your rails you should be careful to clean the rails or you will not get a good electrical connection."

Mr. Bowen said that the 63-lb. rails, 4½ in. high, was the lightest they had used on chairs. The heaviest rail is a 7-in., 63-lb. rail. "We have used no chairs on the 9-in. construction, but use steel chairs on the other. The bond which we use now is the Columbia, made by the Roebling Company, of No. 0000 copper wire."

Mr. Bowen further advised that the majority of joints be cast at night, when the temperature is cooler. "I advise a medium temperature, a little cooler than the medium temperature for your climate, whatever it is. We like to cast at a temperature of between 40 and 50; somewhere about 50 degrees."

Mr. Dodge, of New Haven, Conn., then stated that in New Haven about 1,500 joints have been cast on 50 or 60-lb. rails. He understood that the price per joint was \$3.25, the railroad company paying the freight to and from the place where the work is going on. The company which is doing the work in New Haven follow this plan: when it is thrown up, they start back 2 or 3 ft., and grind it down with an emery iron across that joint. Mr. Bowen said that they do not do that, but file down merely for the purpose of getting the proportions of two rails alike, and when they are of different heights or something of that sort.

In reply to a question in regard to pulling apart of the rail, Mr. Bowen said: "I think that there was one or two cases on our road of pulling apart. Instead of the fracture being just at the joint, it was some little distance back, probably where the difference between the extreme heat and the ordinary temperature of the rail left a partial fracture; there were only one or two cases."

In answer to an inquiry by Mr. Littell, about the experience with cast-welded joints, Mr. Ira McCormack stated that his company, in Brooklyn, had put in 2,000 cast-welded joints on the 94-lb. rail, 9-in. girder, and out of that number there was only one which pulled the rail

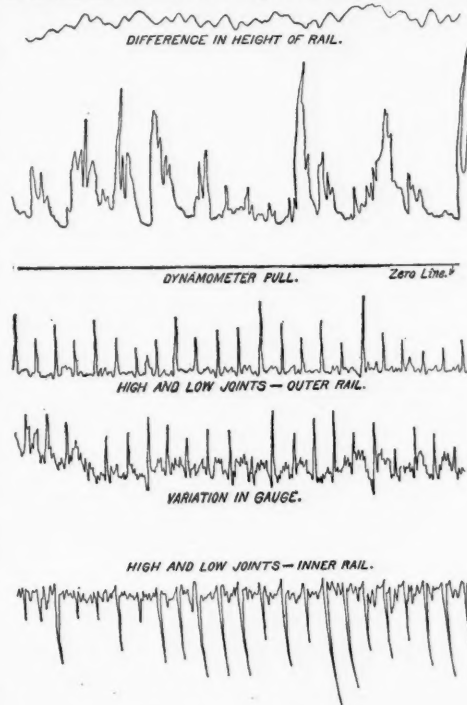


Fig. 6.—Diagrams of Old Tracks.

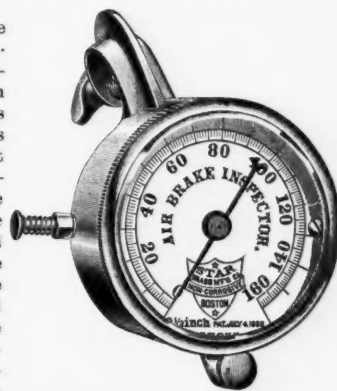
apart; the rail broke about 4 inches from the end. They have given good satisfaction. Some on the old 6-in. rail broke, but this was probably due to the kind of rail.

Mr. Bowen then explained why the rails had been bonded with the cast weld. "We cut off probably 10 or 15 joints, just taken at random along the track, and out of that number I found several in which we failed to have any amalgamation in these little spots which I have described. Then to prevent tearing up a granite pavement afterward to bond, which we were putting down on that line of road, I thought it was cheaper to bond and be sure, than not to bond and be sorry. I am waiting now for the development of that matter."

Air-Brake Inspectors' Gage.

The accompanying illustration shows a pressure gage now being manufactured by the Star Brass Manufacturing Company, of Boston, Mass., for use by air-brake inspectors.

This test gage is 2½ in. in diameter and of similar construction to other gages made by this company, but with the additional feature that it can be quickly attached to either the regular air-brake or air-signal couplings. The inspector is enabled to determine the pressure or test the signal apparatus by attaching the gage to the hose couplings of the rear coach, thus avoiding the necessity of consulting the gage in the locomotive cab. It has been found to be a convenient instrument and is rapidly coming into general use.



Electric Switching on the Brooklyn Bridge.

The first electric switcher for the New York & Brooklyn Bridge Railroad was recently received and we are able to describe its electrical equipment.

Each car is supplied with four G. E. 50 motors and two K 14 controllers, both especially designed for this work. The armatures are slotted, each coil lying in its own slot, and the method of winding followed allows of the removal of any coil with very little disturbance to the others. Each motor is provided with a roller which will come directly over the cable and prevent it from injuring the motor in any way. The K 14 controller embodies all the qualities of the K type, and contains the magnetic blow out. Two circuit breakers, a magnetic fuse box and 12 resistances complete the electrical apparatus.

These motors will switch the four-car trains from the incoming to the outgoing platforms. When the trains are loaded the motors will push them forward over the tilting sheaves, where the cable will be taken up by the grips on the other three cars of the train. The conditions of the contract between the electrical company and the Brooklyn Bridge trustees require that in case of any failure on the part of the cable plant the four motors together shall be powerful enough to take a fully loaded train, weighing 120 tons, across the bridge at the speed of the cable, i. e., 11.3 miles per hour. The motors will be able to haul the heaviest bridge trains up a 3.78 per cent. grade. The trucks of the new cars are from the shops of the McGuire Manufacturing Company, which has recently made the trucks of the electric cars used on the Lake Street elevated in Chicago.

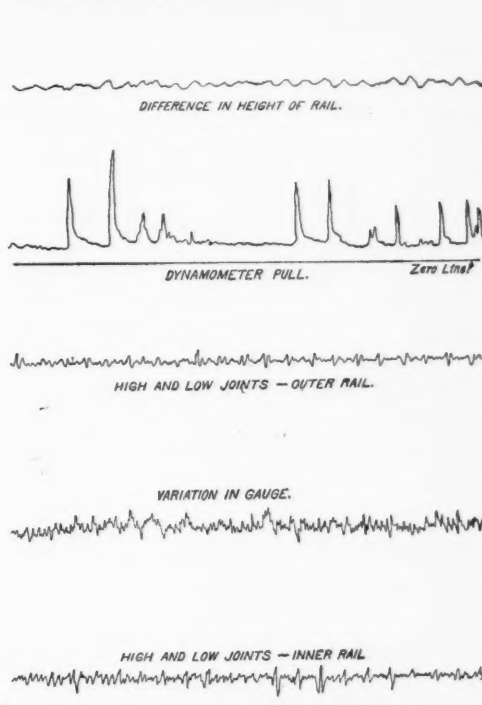


Fig. 7.—Diagrams of New Tracks.

The third-rail contact will be adopted, and current will be taken by four shoes to each motor car, two on each side. These are suspended from a support set between the journal boxes of each truck, and will be so hung as to give a perfect contact with the third rail.

The question of the abandonment of the cable for the complete operation of the bridge trains by electricity will probably be settled in favor of the cable. The uniform speed given to the cars by the cable, and the fact that the cars are spaced at regular intervals, and the balancing of the loads on the up grades and the down grades are special advantages which it is not believed that the officers of the bridge will care to sacrifice.



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EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

For generations it has appeared that if any race on the face of the earth can maintain a democratic government it is the race which speaks the English language as its mother tongue. It has been apparent that if that branch of the race which rules the United States should fail in the experiment which it is now making, the hope of humanity in government by the people and for the people would perish. From the spring of 1861, to the spring of 1865 many sincere and courageous friends of human liberty greatly feared the failure of that experiment. Again, in the summer of 1896, the success of the experiment seemed to be imperiled. In both of those great crises the descendants of those English-speaking men who for 700 years have been fighting for that great idea, characteristic of our race, that law and government exist for the meanest subject, have shown their capacity to govern themselves. In 1861 they won a great physical victory over forces which threatened to disrupt the Republic. Now they have won a great moral victory over forces which threatened to destroy the honor of the Republic and to corrupt the final springs of our liberties. We are disposed to believe that the campaign just closed has brought about a moral awakening which will last for a generation, and we are disposed to believe that the leaders of the political parties on both sides have been taught the lesson which they seem to need to be taught every few years—that the mass of the American people is really honest and intelligent and patriotic. If this is true, we may expect that for a few years at least legislation will bear more of the marks of courage and of confidence in the final good sense of the people. We do not believe for a moment that democratic government would have been imperiled if Bryanism had prevailed. A very few wretched years of Bryanism would surely have brought the American people to their senses; but every intelligent and patriotic man in the nation must be profoundly thankful that we have been spared those wretched years. We attempt no detailed forecast of the immediate business effect of the election. It is most reasonable to suppose that vast sums of money which have been locked up in New York and London and Amsterdam and Berlin and in a thousand little centers will now come forward hungry to earn interest, and it is reasonable to suppose that the men who go into power with such a splendid majority will understand the meaning of this election and will act with such reasonable moderation and judgment as to encourage business enterprise.

Two of the men chosen to act on the Board of Administration of the new Western Freight Association, Messrs. Munroe and Fletcher, have declined, and so the complete establishment of the new order of things will have to be delayed a little. The restoration of tariffs ordered for Nov. 2 seems to have gone into effect without friction, and rates are now maintained by the peaceable spirit of the different roads. As long as the grain movement is heavy enough to

keep most of the freight cars in use, and other traffic flows with tolerable smoothness, a good spirit suffices, and three men, or even Commissioner Midgley alone, can administer affairs about as well as five. There are no arbitrators in the new association, so that with the five members of the Board of Administration free from allegiance to any particular company that body comes pretty near being a Board of Arbitration itself. Any proposal to radically change a rate will, of course, come from some officer of some road, for no five men can keep in touch with the conditions of traffic throughout the territory of the association, and the preliminary discussion of changes, the thrashing-out, necessary to eliminate non-essential issues, will have to be largely done by the traffic managers or general freight agents, as heretofore. The duties of the central board will therefore be very much like those of arbitrators. The roads do not, indeed, bind themselves to abide by the decisions of the board; but neither do the roads in the Joint Traffic Association. In both agreements there is binding language, and that of the Western is perhaps the strongest, but in both cases the power of withdrawal from the association is the emergency brake by which any road can save itself before allowing its competitors to lead it into any intolerable hole. On the other hand, the feature of strength in both associations is the agreement not to take individual action except by formal vote in a directors' meeting. Whether the rigidity inherent in an association operated by a committee, consisting of so few as five members, can be mitigated by frequent consultations with traffic managers, sufficiently to provide the necessary elasticity, remains to be seen. The selection of the five members from five different cities or traffic centers is, of course, a rather crude expedient for maintaining the interests of different companies, for each man will have several roads under his wing, and many of the roads will have interests in two or more of these cities; so that, after all, the main reliance will be on the judicial-mindedness of the members of the board.

An Effort Toward Uniformity—and the Use of Railroad Clubs.

We have received from the Ohio Falls Car Manufacturing Company two letters which are printed below. The first is addressed to a railroad club; the second is to a car-building company.

To the Railroad Clubs:

If the enclosed is of interest to your club, we should be glad to learn of any conclusions it may reach.

It is not expected that this movement will change the standards of large systems. It may, however, bring about a uniformity in the freight-car equipment that is hereafter to be required by smaller roads and private companies who wholly or in part accept the specifications of the builder. Such a result is well worthy the hearty co-operation of every master car builder or foreman, as every shop must repair these cars and must welcome any progress toward simplifying their present boundless diversity.

Whatever preferences your club may express will be understood to be wholly unofficial, applicable solely to miscellaneous foreign cars, and without any reference whatever to the roads you represent.

We are not seeking advertisement and are quite willing that all names be suppressed and your opinion announced through your regular journal.

To the Car Builders:

Would you care to unite with us in establishing a standard 60,000-lb. box car, having as a basis all the Master Car Builders' standards and recommended practices? If so, please send us your preferences as to following-named parts:

Length, width and height, in the clear, inside.
Door opening.
Center to center of center ties.
Section of each sill, end sill and plate.
Height of lining.
Diameter and ends of truss rods.
Wheel spread.
Section and set of each arch and tie bar.
Diameter of column and oil-box bolts.

We are addressing this inquiry to several car builders, will tabulate the replies, and communicate the result by letter or through some railroad paper.

It is believed that this movement will result in creating a uniformity among the contract car works, primarily of the parts mentioned, and later of many of the less essential parts, as well as of fruit, coal, stock and flat cars. Modernness will be maintained by incorporating all standards as successively adopted or recommended by the Master Car Builders' Association or by the united judgment of the manufacturers.

In reading these letters two entirely distinct lines of thought are suggested. One is immediately reminded of the important position which the railroad clubs have taken in railroad affairs. One is also reminded of the difficult but inevitable progress which is making toward simplicity and uniformity.

When a man begins a new investigation into some matter of mechanical detail, or when he wishes to collect any specific information, the most natural thing to do is to start his inquiry through a railroad journal or through the railroad clubs, and year by year we observe a growth in the tendency of individuals and of firms, and of the chairmen of the committees of the two great technical railroad associations to make more and more use of the railroad clubs. We will not say that they make less and less use

of the railroad journals, for that, we think, would not be true. The fact seems to be that the new facilities tempt them to make more frequent investigations, and to make those investigations cover broader fields.

Last September the editor of this journal, in speaking before the Western Railway Club at the annual banquet of that club, touched upon this subject and upon the competition which has been established between the railroad clubs and the railroad newspapers. He said: "A good deal of the thought and information which would naturally have found expression in the pages of the technical journals now comes to light in your halls and is spread abroad through your printed transactions. Your secretaries and your publishing committees have become the active competitors of the editors for good copy. You used to rely on your favorite journal to know what other men were thinking and doing. Now you get a good deal of this through the clubs." Furthermore, the railroad clubs have, to some extent, become competitors with the journals in the advertising field. At least the railroad clubs get a good deal of advertising for their printed periodicals. Whether or not they prevent any advertising going to the railroad journals we cannot say. Probably they do to some extent.

Nevertheless, we question if this new competition is going to injure the journals. On the other hand, one could make a pretty good argument based on the proposition that the increased intellectual activity due to the clubs will cause more reading and studying to be done, will demand higher things of the railroad journals, will raise the standard on which they are conducted and increase the interest with which they are read.

But however all this may be, there is no question that the development of the railroad club within the last half dozen years has introduced a new and very useful element into the business, or the art, or the profession of railroading. It has created a new machinery for investigation and is destined to modify the methods of getting and distributing information, and we should not be surprised to see, eventually, the two great technical associations merged into one which will be practically a digesting and recording machine for the year's work of the clubs.

But all this is quite aside from the subject which the enterprising car-building concern has introduced. Concerning that we need not enlarge upon the desirability of accomplishing what the Ohio Falls Company has started out to try to accomplish. A reasonable uniformity in practice is one of the first and most important elements of economy. One of the most striking examples of what can be done in this way may be found in the history of the development of the modern rail section. Fifteen years ago the rail mills had to carry in stock rolls for about 300 current sections of rails.

The American Society of Civil Engineers began about 1889 the movement to introduce a standard set of sections, and in 1893 this movement culminated in the adoption of a set of standards which the society could recommend. The progress in the adoption of these standards has not been as rapid as the enthusiasts had hoped it would be, but it has been important and in fact very encouraging. Statistics on this point we shall reserve for a later article.

It seems as if it might be taken for granted that an attempt to harmonize practice in freight-car building is of such immediate financial importance to car builders and to the railroads that it is sure to be received with great favor on all sides, and to have hearty support. It seems also as if the car-building companies themselves were the very people to push such a movement. On the other hand, it is very obvious that there will be much difficult detail work to be done before very active progress can be made. A great number of individual parts must be considered, and many personal preferences and prejudices must be harmonized before anything like uniform standards will be generally accepted. We should suppose, therefore, that the work would go slowly, but we shall hope that at least it will have an enthusiastic start.

Anthracite Coal Production For Nine Months.

During the last week in January of this year, the anthracite coal presidents, at the last of a series of excited meetings, reached an agreement allotting to each interest a percentage of the year's coal output. The various percentages were as follows: Philadelphia & Reading, 20.05; Lehigh Valley, 15.65; Central of New Jersey, 11.7; Delaware, Lackawana & Western, 13.35; Delaware & Hudson, 9.6; Pennsylvania Railroad, 11.4; Pennsylvania Coal Co., 4; Erie, 4; New York, Ontario & Western, 3.1; Coxie Bros., 3.5 and New York, Susquehanna & Western, 3.2.

The adherence of the producers to their allotments up to this time has greatly surprised the public. The

excesses of certain important interests since the agreement went into effect are in the aggregate less than one-half of one per cent. Violation of agreement had been so notorious in the past that the public had little reason to expect anything but failure now; but Wall street thought differently, and Wall street was right. Not even now is it definitely known what changes were made; but in a general way it seems to be understood that there is an inter-ownership in the leading properties by a syndicate composed of the Vanderbilt, the Morgan and the First National Bank interests, and that this controls four of the leading properties, viz., Reading, Lackawanna, Jersey Central and Erie, and possibly the Delaware & Hudson. The others are supposed to be kept in line by the knowledge that control can be taken from them without difficulty if necessary in the interest of trade stability. Barring a sales agents' meeting immediately after the agreement was reached there has been no general meeting of any of the coal interests since the agreement went into effect. Just before the close of each month word has been passed around as to the allotment for the following month. All the interests have accepted these figures without question and each has produced its proportionate share. There have, however, been excesses from month to month. The total allotment for eight months to September was 25,750,000 tons, against an actual production during the same period of 26,757,148 tons. This excess of about one million tons is regarded as good evidence that no ironclad agreement exists between the interests. Other data in substantiation of this point are given below.

Prices have not been very strictly watched but there has been a rather sharp restriction of production. It seems to have been the policy to restrict the output during the first half of the year, when prices were at the minimum, with a view of making production heavy during the last half when prices were the highest. The extent to which this was carried out is shown in a comparative table of monthly productions printed below. The production ending September was 30,601,370 tons against a production during the corresponding period of 1895 of 32,518,183 tons. The difference of over 1,600,000 tons, which represents the restriction, enabled the various interests to secure prices much better than those of a year ago. If the production had been confined strictly to the allotments, making the decrease a million tons larger, as was originally intended, the trade would now have been upon the top wave of prosperity. But there is, of course, no controlling body, and probably none could be formed.

In the following table is given the monthly production for nine months to Sept. 30 for three years:

	1896.	1895.	1894.
Jan.....	3,844,222	3,063,334	2,622,808
Feb.....	2,603,622	3,133,246	2,291,472
March.....	2,999,254	3,761,665	2,495,058
April.....	3,013,190	3,159,122	2,757,306
May.....	3,125,170	3,788,945	3,793,303
June.....	3,314,196	3,777,644	5,112,358
July.....	3,750,249	3,692,378	3,865,215
Aug.....	3,949,822	3,836,366	3,089,843
Sept.....	4,001,571	4,065,514	3,270,612
Total.....	30,601,373	32,218,163	29,636,692

The movement in prices during the eight months of the January agreement can be best understood after a short review of prices during 1895. The demoralization in that year developed in April and reached its worst in August, when stove coal averaged \$2.75 per ton. There was a slight improvement in September and in October quite a little boom, but it was short lived. The average on that size of coal for the year was not far from \$3.05. The effect of the agreement was first felt in February, when the average of stove coal advanced 7 cents to \$3.38. The next month the advance was 14 cents, the next 1 cent, the next 3 cents, the next 8 cents, the next 8 cents, the next 1 cent, a total of 42 cents for seven months. The average for eight months, including January, was about \$3.55 against \$3.05 for the twelve months of 1895. This gain has been net. From time to time during the period under review four circulars were issued to the trade. At tidewater there were three advances of 25 cents each, following the first circular. These various official documents and the dates on which they were issued are given in the following table:

Size.	Jan. 31.	May 1.	July 1.	Sept. 1.
Broken.....	\$3.25	\$3.50	\$3.75	\$4.00
Egg.....	3.50	3.75	4.00	4.25
Stove.....	3.75	4.00	4.25	4.50
Chestnut.....	3.50	3.75	4.00	4.25

Likewise at Buffalo there were four circulars as follows, all gross tons:

Size.	Feb. 1.	June 1.	July 1.	Sept. 1.
Broken.....	\$4.15	\$4.25	\$4.50	\$4.75
Egg.....	4.40	4.50	4.75	5.00
Stove.....	4.40	4.50	4.75	5.00
Chestnut.....	4.40	4.50	4.75	5.00

At Chicago the February circular was found to be too high and on May 1 was dropped 25 cents. The

advance since the last named date has been 75 cents. The table prices for net tons follows:

	Feb. 1.	May 1.	June 1.	July 1.	Sept. 1.
Broken.....	\$5.25	\$5.00	\$5.10	\$5.25	\$5.35
Egg.....	5.50	5.25	5.35	5.50	5.60
Stove.....	5.50	5.25	5.35	5.50	5.60
Chestnut.....	5.50	5.25	5.35	5.50	5.60

The tidewater circular gross price of \$4.50 for stove coal (equal to \$4.35 net), that was promulgated in September, was not realized on actual sales during that month by 40 cents on the average. The difference between actual and circular prices in previous months was equally striking. These irregularities all go to show that there was no pledge or penalty applicable to this question of prices, and that the various interests were free to ask what they desired. Long time contracts, as in the past, operated to reduce the averages. These were made with favorite customers at the duldest season, deliveries being spread over a long period.

The improvement during the month of September was more pronounced than in any previous month of the nine, in domestic sizes, though some ground was lost in small steam sizes. The average returned by a majority of the companies for stove coal in this month was not far from \$4, a gain of fully 25 cents over August. The general industrial depression materially curtailed the consumption of pea and buckwheat.

The month of October opened favorably, but certain interests, being unable to dispose of their small sizes, cut the price of chestnut. This disclosed serious weakness and led to a generally lower range of values. It was a mistake not to recognize the industrial depression and decrease the October allotments. The amount was fixed at 4 1/2 million tons, against requirements of fully half a million less. This caused an accumulation of stocks, notably at tidewater, and left the companies with coal to burn. The effect of this over-supply on the pea and buckwheat sizes is very pronounced and pea coal has been quoted at \$1.50 to \$2.00 a ton. During the record-breaking month of August, 1895, it was \$2.05 and that was then considered a bankruptcy figure. It averaged in July and August of this year \$2.35. This loss of fully 50 cents a ton, in view of the fact that fully 33 per cent. of the coal mined is pea, buckwheat and culm, indicates one of the factors that are troubling the anthracite market to-day. Despite this weakness, stove and egg sizes are fairly firm at perhaps a shade better figures than the average of September. Cold weather and an industrial quickening are factors necessary to any general improvement.

Some little time ago an attempt was made to hold a meeting of anthracite freight agents for the purpose of reducing coal freights. The first week in September they were advanced 15 cents between the mines, and tidewater; 15 cents (to \$1.60), and 25 cents (to \$2.25) from the mines to Buffalo. Inasmuch as the most of the coal mined by independent operators is sold to transporting companies at 60 per cent. of the price realized therefor at tidewater, the roads endeavor to keep the fixed rate 40 per cent. of the tidewater selling price. It was advanced, as noted, in the expectation that coal in September would be higher than it really proved to be. A majority of the interests refused to attend the meeting, believing that the market price would advance to a figure warranting the existing rate. Average market prices are still considerably below this expected level.

Causes of English Railroad Accidents.

Of the 160 or more train accidents reported in Great Britain during the calendar year of 1895, 69 were inquired into by the inspecting officers of the Board of Trade, and some account of the report of the Secretary of the Board for the year was given in our last issue. As a supplement to that account we give below some extracts from the reports of the inspecting officers on the cases investigated. The decisions and comments of these officers constitute one of the main channels through which the attitude of the Government toward the railroads is expressed, and as the English Government, in its paternal interest in the safety of passengers and employees, goes into much more minute detail than has ever been done in this country, and as the activities of the government as a whole, in this matter, are more intelligent than anything we are familiar with here, the reports contain much that is instructive; and the circumstances of individual accidents are often of such a nature as to be of interest to Americans, regardless of the magnitude of the results of the accident. A study of English operating methods, as illustrated in these reports, is also interesting in itself. The roads of Great Britain ran nearly 339 million train miles last year on 21,174 miles of road, equal to 16,000 train miles per mile of road. This is nearly four times as many trains per mile of road as were run in the United States (U. S., 766,856,853 train miles, 180,657 miles of road), and yet there were only 10 accidents in which any person was killed. In this country we recorded during the same time 275.

The condensation of the inspectors' comments, as made by the Secretary, is classified into derailments from defects of road; accidents from boiler explosions and other defects in rolling stock; from trains entering stations too fast; rear collisions; collisions at junctions; collisions within fixed signals; butting collisions, and several minor heads. We take them up in this order.

The first report is on the derailment at St. Neots, Nov. 10, from a broken rail, already described in the *Railroad Gazette* (March 13). The derailment of a passenger train on the Great Western, April 13, is found to have been due to the fact that a preceding train, drawn by two engines, had run over the line too fast and had "knocked it about sufficiently to set up an oscillation of the engines of the following train," which resulted in the derailment. On Dec. 26, on the same road, a fast passenger train was derailed by a landslide, a rare occurrence in England. The inspector says that no person could be blamed.

On the Isle of Wight Central there were two accidents, the principal causes of which were decayed sleepers and very bad track generally, conditions which we had supposed were to be found only in the wild and woolly regions of Cis-atlantic countries.

In discussing a derailment on the London, Brighton & South Coast, Aug. 31, the inspector notes the satisfactory action of the (Westinghouse) automatic brakes. Two portions of the train ran, separately, one close behind the other, for 450 ft. after leaving the rails; and they came to a standstill with comparatively little injury.

On June 26 a passenger train on the Midland & South-western Junction was derailed by running too fast, the rate of speed being about 35 miles an hour where the regulation limit was 15. The inspector figured out that the schedule of this train over this part of the road required a speed of 50 miles an hour. This he deems "too high for a single line," an opinion which must strike terror to the hearts of the managers of some railroads in America. We believe there are a few single track roads here which still venture to run trains at 50 miles an hour, and sometimes a trifle faster. In this case the inspector found that the radius of a curve had been diminished without leave from the Board of Trade, and he recommended the company to restore it "to its original condition as authorized by Parliament."

Near Ballynahinch Junction, Dec. 5, a mixed train broke in two, and five passengers were somewhat injured. The inspector found that the company was violating the agreement which it had made to run a certain proportion of braked wagons next to the engine. The coupling was broken by a sudden stoppage and so the inspector remarks that the use of the steam brake in switching is undesirable.

On the Great Northern, Feb. 28, there was a derailment from the breakage of an engine axle which was 25 years old and had run 578,000 miles. The breakage is held to have been "due to age combined with the effects of severe frost." The inspector says that an age limit "has been suggested" for engine axles, but that the railroads have not yet seen fit to act upon the suggestion.

On the Great Western, Dec. 28, a car in a passenger train ran two-thirds of a mile on the sleepers, one of the wheels having become loose. "The company has now adopted means for largely increasing the grip of the wheels on the axles." On the Waterford & Central Ireland road, March 26, the engineman and fireman of a freight train were scalded to death in consequence of the rupture of the firebox by a broken main rod, the engine being inside-connected. It is believed that the main bearing had become so hot that the rod became immovably fixed to the crank axle and, breaking off, was thrust through the plates of the firebox as a rigid bar. The heating of the bearing was due to want of oil; and it was found that the packing in the oil cup had probably been neglected for a long time. It was found that the runner, besides being negligent in this matter, had wedged down both safety valves.

On Dec. 20, at Oldfield Road, on the Lancashire & Yorkshire, a passenger train, standing at the home signal, was run into at the rear by another and 25 passengers complained of being injured. There was a dense fog at the time and no fogman was on duty, the fog which had been prevailing having lifted a short time before. The inspector calls attention to the necessity of fog-signal apparatus operated from the cabin. Possibly these devices ought to be more thoroughly proved, but in the vicinity of large towns they are greatly needed, "if only as a substitute for fogmen until the men can reach the spot." Whether any English manager is willing to provide expensive apparatus for such a very brief service as that would be does not appear. The inspector goes so far as to say that several patterns of fog-signal apparatus have been tried "with a certain amount of success," a statement which we could easily have believed even if it were not given with the authority of the British government.

On the South Eastern, Nov. 1, there was a side collision, in consequence of a runner assuming that a signal lowered for a preceding train was intended for his train. There was a dense fog at the time and the runner admitted that he did not duly obey the caution rule. There was a fogman on duty, who claimed that he had not time to put down a torpedo between the two trains, but he did not shout at the runner of the second one, as he might have done. The inspector makes the somewhat clumsy recommendation that when there is a dense fog at a junction all trains approaching on the branch

should stop and wait for verbal instructions before passing the home signal.

On the Belfast & County Down road, Nov. 29, a passenger train ran into a preceding freight standing at a station. In this case the engineman claims to have seen a white distant signal light, when in fact the lamp showed red. The inspector concludes that he must have looked up when he was immediately beneath the signal, "which goes to show one of the advantages of adopting a green light for the all-right signal, as has been done by the principal railway companies in Great Britain." This road has not adopted the standard rule forbidding a signalman to admit a train until the preceding train has passed several hundred yards beyond his home signal, and the report censures the company accordingly.

On the Great Eastern, May 29, there was a collision at a time when there was a fog, but the obscuration was intermittent, and the evidence as to the density of the fog was conflicting. The inspector says that a train should not be allowed to proceed to a station where a train is between the home and starting signals, except when the weather is perfectly clear "with no suspicion of fog."

On the Great Western, August 17, there was a little collision in coupling up a passenger train at a junction where a car had been cut out. The inspector found that a helping engine was attached in front without the air-brake being connected up, and that the runner of this helper, which was necessarily the leading engine of the passenger train, was only classed as a second-class fireman. In another passenger train collision on the same road the inspector found the runner careless and unskillful; his experience had been mostly on goods trains, "which perhaps renders his mode of shunting somewhat rougher than is permissible on passenger trains."

On the same road, Dec. 21, there was a collision due to the mistake of a brakeman who saw a white light and took it for an all-right signal, when it really had no connection with the train movement. A tail-light, which he should have seen, was obscured by steam. The inspector suggested that the use of a white light by fogmen for all-right should be abolished, and green substituted, so as to be in accordance with the practice on fixed signals. He thought "it would be an advantage" if a distant signal at this place, 45 ft. high, were to be lowered, so as to be more easily seen in time of fog. It seems to us that this recommendation would apply with great force to hundreds of signals in England. On the North Eastern, Aug. 23, a pushing engine, following a passenger train and soon to be coupled to it, was run into the hind car with considerable violence. The inspector says that helping engines should, as a rule, be attached to the front of passenger trains; but if placed at the rear the coupling should be made before the train starts, and the air-brake connected. In this case the helper had only a hand brake, and this was in violation of an order which had been made by the Board of Trade.

At Binegar, on the Somerset & Dorset, Feb. 5, an empty engine overran a home signal and struck a freight train 240 ft. beyond it, but the runner had not been warned of the necessity for special care in approaching Binegar, and so he gets off without severe censure. As the descending grade is steep the inspector thinks the "line clear, but station blocked" signal should not be used here at all.

On the Dublin, Wicklow & Wexford, Aug. 6, there was a butting collision, quite violent, due to the carelessness of an engineman in starting out without the staff. He did not discover his mistake until he had run three miles. There was a semaphore starting signal, which was lowered to permit the engineman to start, and the inspector recommends the company to try "a recent invention," which locks the starting signal at danger until a tablet has been withdrawn. The engineman in this case had been on duty 17 hours, except that he had had two intervals for rest, one four hours and one two hours; but these intervals are held insufficient to justify keeping a man on duty until 2 a. m. when he begins at 8 the preceding morning. The hours of the two guards on the train were still worse, they having been at work 19 hours at the time of the collision. The excuse was offered that these hours were exceptional, but the inspector does not accept such an argument.

On the North British Railway, Oct. 14, a part of a passenger train was derailed by the carelessness of a signalman in turning a switch under the cars, and the inspector uses the case as an argument in favor of having the locking bar actuated by the same lever as the switch rails. Had this switch been so fitted, the man could not have moved it after the engine had reached it. (The signal was at danger all the time, and the switch unlocked.) "Opinions differ as to the best method of fitting these appliances, but the inspector hopes that those officers responsible for the signaling on railways and signal manufacturers will consider the question in the light of this accident."

On the London & North Western, on Nov. 26, a freight engine going back for some cars which had been lost off from the train, was run, at considerable speed, through a "runaway catch point" (presumably a derailling switch intended to safeguard runaway trains on a grade) and tumbled down a bank; and the engineman and another man were killed. The runner seems to have forgotten that there was any such thing as a catch point in the track at this place. The uncoupling of the train is discussed at length, though the precise cause could not be determined. These chains frequently become unhooked, though generally, the inspector says,

without serious consequences. He thinks that the shape of most of the hooks in use is faulty.

The most interesting accident in 1895, so far as the circumstances under which it occurred illustrate those English operating methods which Americans are most interested in, was a rear collision at Basingstoke, on the London & South Western, May 23. The report in this case is by Major Marindin. A passenger train approaching that place about 9 p. m. was stopped by failure of the engine when it was about opposite the distant signal, the rear car coming to a stand 318 ft. outside that signal. The train was so far from the cabin that the signalman could not, or at least did not, see it; and forgetting whether the train had arrived or not, he gave permission to the cabin in the rear to admit another passenger train, which came on and ran into the standing train, although the line was perfectly straight and the grade almost level. The distant signal, close to the standing train, appears to have been at danger when the second train approached, and the inspector points out that if the negligent runner had acted according to the strict reading of the rules, he would have reduced his speed on seeing this signal and then would have been able to stop before he struck the other train; "but," says the inspector, "this rule requiring a train to be able to stop at any point after passing a distant signal at danger is never attended to, and is not meant to be attended to; a distant signal is now looked upon merely as an indicator of the position in which a driver may expect to find the home signal. . . . I do not, therefore," says Major Marindin, "attach the least blame to the driver who, on the contrary, deserves credit for keeping a good lookout. . . . It is a mere farce to retain in its present form a rule which is never enforced."

The guard of this train should have gone back immediately, according to the rule, "but he can hardly be blamed for going first to ascertain what was the cause of the stoppage"; though Major Marindin remarks that if he had been a little smarter he might have got back farther.

We congratulate the English railroads on their good fortune in at last having an official of the government tell them of the absurdity of their rule requiring trains to be able to stop 6 in. beyond a distant signal, even when, as in case of fog, the engineman cannot see the signal until he gets within 50 ft. of it. Of course they knew of this absurdity before, if they gave any thought to the matter; but possibly Major Marindin's action in making this conspicuous inconsistency public will have some effect in getting it abolished. The same illogical and impracticable rule is still ostensibly in force on some American railroads.

But when Major Marindin passes no censure on an engineman who runs into a train ahead of him that he can see for four miles, we are somewhat staggered. If a red tail light cannot be seen more than 600 ft. away it ought to be made larger. If the semaphore signal lights are so high in the air that a runner cannot see them without getting his eye out of range with the lights on the cars, the signal posts ought to be shorter. And if enginemen feel so sure of the safety of the indications of the fixed signals that they do not heed signals on the cars when they do see them, what is the use of having tail-lights? This Basingstoke incident should perhaps be taken as a reminder of what we in this country are coming to when we shall have adopted the block system universally.

The failure of the English guard to go back with a red light, or even to think of going, and the very mild character of the inspector's comments on the failure, are not different from what we have reported in accounts of English collisions before, except that in some former cases there has been no censure whatever.

Annual Reports.

Atchison, Topeka & Santa Fe.—The new company has been in control since Jan. 1, and a report of the operations for the first half-year has just been issued. In July last a summary of the earnings and expenditures during the two years of the Receivership, was published, but this did not give many figures, so that the present is the first detailed account of the Atchison's operations we have had since June 30, 1893.

At the outset it may be said that the new company more than earned its fixed charges for the six months. The surplus is not nearly so large as was reported in the preliminary statement issued in August, and is actually but \$144,720. The fact that any surplus was earned is important and encouraging. The company has had to meet many adverse conditions affecting its revenue in the beginning of its history, and moreover, the first half year never shows as good earnings as the second half.

The results of the half-year's operations are given briefly below:

Gross earnings.....	\$13,590,235
Operating expenses (not including taxes and rentals).....	10,207,429
Net earnings.....	\$3,382,806
Total income.....	3,449,471
Rentals and taxes.....	1,016,601
Fixed charges.....	2,291,150
Surplus.....	\$144,720

The following is a comparison between earnings and

operating expenses for the first six months of 1895 and the same period in 1896:

	1896.	1895.	Inc. or dec.
Freight.....	\$9,130,532	\$8,938,379	I. \$192,153
Passenger.....	2,964,488	2,852,921	I. 111,567
Mail.....	468,787	450,547	I. 18,239
Express.....	465,520	460,288	I. 5,232
Miscellaneous.....	560,907	729,641	D. 168,734

Total.....\$13,590,234 \$13,452,776 I. \$137,457

These figures are for 6,435 miles of operated road. As compared with the same mileage last year, the earnings show little change—only one per cent. in gross. The marked feature of the year has been the very considerable reduction in working expenses, nearly \$950,000 or eight per cent. Chairman Walker explains, however, that \$428,677 of this large decrease is due to the fact that certain expenses of the Receivers are treated as prior liabilities and do not appear in the expenses of the half-year as they would appear under a continuous management.

Making this allowance, the saving in working expenses by the new officers is reduced to \$517,531 in the six months. But this is a considerable saving, being about four per cent. of the gross revenue of the period, and we are informed that all of this and more was saved in the item of conducting transportation; the expenditures on maintenance were actually greater than in the first half of 1895.

The favorable comparisons have extended into the new year, and the reports of earnings show heavy gains in both gross and net. The September earnings, just published, show a gain in gross of over \$347,000, but net gained \$459,000. For the three months of the fiscal year the gain in gross is over a half a million dollars, and in net earnings \$1,098,000. The gain in net earnings this year is more than 100 per cent., the earnings in 1896 having been \$2,083,000, and in 1895 \$985,000.

The ratio of expenses to gross earnings on the Atchison has been and continues to be high. Under the receivership working expenses (not including taxes) were 82.9 per cent. of the earnings. In the six months of 1896 they were 75 per cent. The officers believe that this ratio will be smaller in the immediate future. During the receivership working expenses were large, partly because a receivership is necessarily a costly method of operation, but chiefly because many improvements were made to put the roadway and structures and equipment in good condition, besides the large sums spent for these purposes and charged to special account. For instance, the Receivers spent \$2,806,000 for improvement, construction and equipment accounts, and turned over to the new company materials and supplies valued at over 1¼ million dollars. Ties, rails, bridges and equipment have been thoroughly renewed, and operating expenses are now reflecting the benefit of these improvements. Additional improvements have been made in 1896. The freight equipment is practically all equipped with air-brakes and automatic couplers are now being applied; wooden bridges and trestles have been replaced with steel or filled in; 6,000 tons of 75-lb. rails were put down to replace 60-lb. rails. Much of the cost of this work was charged to operating expenses, but in the half year expenditures on capital account were \$435,000.

The traffic statistics do not give any comparisons with previous years. The total ton mileage was 814.9 millions (440.7 millions eastbound and 374.1 millions westbound). The average haul was 231 miles, but on westbound it was 251 miles, 30 miles more than the average haul eastbound. The rate per mile was 1.120 cents, which is rather higher than the ton-mile rate reported by other large Western roads. The passenger mileage was 127.7 millions and the average journey 68 miles. The passenger rate per mile was 2.321 cents (on the New Mexico & Arizona road the average rate is 5.78 cents).

The company now has outstanding bonds of various issues, amounting to about \$110,549,000, on which the annual interest charge is \$4,650,590, or \$387,549 a month. It is interesting to note that the taxes were \$682,297 in the six months, or a little over \$100,000 a month, and we believe that the estimate of the total taxes payable by the Atchison in the year fixes the amount also as over \$100,000 a month. In fact, the taxes of the half-year were about five per cent. of the total gross earnings and 20 per cent. of the net earnings.

In explaining the sale of the Atchison's interest in the St. Louis & San Francisco it is stated that an immediate decision was necessary because of the pressure for an early sale of the property. The directors were presented with the alternative of selling the Atchison's interest in the property on favorable terms or purchasing all other outstanding interests, requiring a large outlay of cash and securities. The control of the St. Louis & San Francisco was considered desirable, but financial reasons made it more prudent to sell than purchase. The adoption of this course has greatly strengthened the treasury of the Atchison in the depression which has followed.

The report refers to the adjustment of earnings and expenses, on business interchanged with the Atlantic & Pacific, made in January, 1894, as the result of the award of the Arbitrators nominated after the appointment of an independent Receiver for the Atlantic & Pacific. The Atchison paid from \$15,000 to \$20,000 per month increase of divisions on through business interchanged, and approximately one-half of the rental on the 250 miles of the Mojave Division of the Atlantic & Pacific. The amounts falling due under this arrangement have been deducted from the earnings of the company and no further charges remain to be made against income on that account. The award was not binding after July 1, and since then modifications have been made.

The report states that whatever the future relations of the two companies may be, the charges against the Atchison cannot be greater than in the period covered by the present report. Negotiations looking to the acquisition of the property on a permanent basis for handling joint traffic have been discussed for several months without definite results as yet. In the meantime traffic is interchanged without delay.

An important action taken by the new managers, has been the leasing of its coal mines in Colorado and Kansas for three years. In explaining this action it is stated that in these two districts competition has been excessive, and the working of the coal mines by the railroads creates friction, frequently resulting in loss of traffic, and altogether it has seemed doubtful if any profit could be made by direct management under present conditions. In the leases minimum royalties and rentals are guaranteed, and the railroad company is assured of a coal supply at lower prices than have ever been charged to the railroad when it directly operated its own mines.

Brief mention is made of the use of oil for locomotive fuel, and it is stated that more than one-half of the locomotives used in Southern California now burn oil as fuel, and the improvement is now being carried still further.

As long as railroad trains are run under regulations which make safety depend on the arrival of the train at some point at a certain time, the use of good watches is a vital element in train operation, and the adoption by many roads, during the past few years, of regulations in which the old five-minute allowance, for possible defects in time-pieces, is abolished, shows that the highest possible degree of accuracy has a definite value and is appreciated by practical men. If accurate mechanism is important, accurate reading of the time is no less so; and one road, the Delaware & Hudson, has recently prescribed four apparently unimportant conditions for the guidance of its watch inspectors which are of interest as showing the wisdom of guarding against error at every point. The Delaware & Hudson inspectors are instructed to reject (1) any watch with a fancy dial, 2) an open-face movement in a hunting case, (3) a watch with the second hand at the figure III., and (4) a watch with a sweep second-hand. All these provisions are for the purpose of making the reading of watches easy and uniform. The objection to a fancy dial is obvious. The second and third rules are necessitated by the fact that open-face dials are made so that the watch is naturally grasped at the top, while hunting-cases, intended to be grasped at one side, are so made that such a dial when placed in one of them is not in its right position. One has to take care to turn the watch to bring the figure XII. to its natural position at the top. Watches with the second hand at the figure 3 are those having movements originally made for hunting cases, but the dials of which were afterward re-lettered, so as to make the movement fit into an open case. The trouble with a long second hand is that it may possibly be mistaken for the minute hand. In this connection we may note that the use, in every situation where time is a vital matter, of two watches or clocks is a point which ought to receive more attention than it does. The only rule on this point is that both conductor and engineman shall see to it that the train does not start too soon or arrive too late; but these men are not always within speaking distance of each other at the critical moment, and they often depend upon one another instead of taking, as they should, independent action. Even if they obeyed the rule, there are still numerous situations unprovided for, as in the case of engines or work trains moved short (or long) distances without a conductor. Careful conductors and enginemen compare watches frequently, without compulsion; why not require such comparison at every critical time and place? At first thought this seems like a troublesome regulation, necessitating much running to and fro, and delay; but if the rule were tried and its merits made known, ways would be devised to carry it out with very little friction. The joint-responsibility rule ought to be supplemented by the injunction, "In every case where an error in time would be dangerous, at least two time-pieces must be consulted; never depend upon one watch or clock alone."

Several years ago the Illinois Central began to encourage its employees to buy the stock of the railroad by a system of easy payments. The company is now offering to employees stock in the newly acquired line into Louisville, the Chesapeake, Ohio & Southwestern. The par value of the stock is \$100, and the present market value \$92. The stock can be bought by employees and paid for in monthly installments of \$5. Four per cent. interest is paid on deposits and five per cent. dividends are paid on the stock. Only one share at a time can be bought on the installment plan, but any number can be purchased outright. We have no doubt that Mr. Debs and his pupils see in all this the vile machinations of the coercing employer who wishes to put the employee in a position where he will not want to strike; but the employee who is saving money has little use for Debs and Altgeld.

NEW PUBLICATIONS.

Die Schwingungen eines Trägers mit bewegter Last. [The oscillations of a girder under a rolling load]. By Dr. H. Zimmerman. Berlin: W. Ernst & Son, 1896. Octavo, paper, pp. 46 and 4 plates.

One of the most difficult mathematical problems in ap-

plied mechanics is that of determining the stresses in a beam or bridge due to the velocity of a rolling load. This pamphlet deals with the problem in its simplest phases, the beam being of uniform cross-section, the load a single concentrated weight, and the inertia of the beam itself being neglected. The conclusions of the author are given in a series of diagrams which show the curves traced by a point of the beam underneath the load as the load itself moves horizontally with different velocities. These curves do not differ essentially from those derived by Stokes in his celebrated discussion of 1849, and hence add little to our knowledge of the subject.

Under the limitations mentioned, the author concludes that a single load moving over an I-beam or plate girder at a velocity of 30 miles an hour increases the static stresses about six per cent., while for a velocity of 60 miles an hour the increase is 14 per cent. If the inertia of the girder be taken into account, however, as it ought to be, it is probable that these percentages will be greater, as Stokes has plainly indicated.

Great credit is due to Dr. Zimmerman for the method by which he has simplified the mathematical part of the investigation. Instead of integrating the differential equations by series, as was done by Stokes, he uses hyperbolic functions, whereby the discussion is not only rendered more concise and exact, but the computations are also materially abridged. It is to be hoped that the path found by the author may be extended by himself and by others until the problem is solved in all its phases. In order to do this the girder must be taken to be one of uniform strength, or at least one of variable cross-section and the rolling load must be an actual advancing train instead of a single weight, while also the resistance of the mass of the girder to sudden deflection must be included. The consideration of these elements renders the problem one of the greatest mathematical complexity, yet undoubtedly the time will come when its solution will be effected. As that time is probably far distant, it may be well to note that the indications are that the effect of a train velocity of 60 miles an hour is to render the stresses in some of the members of a bridge 40 or 50 per cent. greater than those computed by static theory.

The Law of Strikes and Lockouts; by Thomas S. Cogley, 377 pages. Washington, D. C.: published by W. H. Lowdermilk & Co.

This book, dated 1894, and dedicated to Hon. Thomas M. Cooley, is said to be the only one of its kind. The author classifies his matter intelligently, considering first criminal liability and then civil. He seems to have made a very good historical sketch, going back to the early English decisions, made when a workman had no rights whatever. In this connection it is interesting to note that a law of Queen Elizabeth's time (1532) compelling all laborers and artificers, who were able, to work upon demand, and empowering justices to fix the rate of wages, remained upon the statute books until 1875. The present attitude of the law and public sentiment are first noticeable in English laws passed in 1824 and 1825. One of the first important English decisions here reported very fully was in 1846. The earliest American decisions were by minor courts in Philadelphia and New York, in 1806 and 1811 respectively. The records of these and other old cases have been gathered from pamphlets and other sources now hard to get at. They are reported at great length, the Philadelphia case occupying 16 pages. The difficulty of the author's work is indicated by his statement that not a single case was found indexed in the reports under "strikes."

Mr. Cogley finds no record of a strike that was not an infraction of the law, and so he naturally concludes that it is beyond the wit of man to devise one that would be legal. "The mere assembling together in large numbers inspires fear, or at least apprehension, and, in the mind of the timid, indescribable dread." But he quotes the decisions of the courts recognizing the theoretical right to strike peaceably.

Seventeen pages are given to the laws of various states against intimidation. The latest court decision reported is that on the Ann Arbor case. Much of the best material in this book consists of long quotations from judicial decisions.

The Street Railway Journal for October is issued as a Souvenir of the St. Louis Convention of the American Street Railway Association. It contains over 300 pages, printed on fine paper and handsomely illustrated. Among other items of interest the city of St. Louis and its transportation system is discussed at length. The article on Street Railway Traffic in St. Louis is illustrated by six maps, the preparation of which involved considerable research. These show the distribution of population and the street railroad systems of the city at every decade from 1860 to 1890 and the present distribution of the population and the location of the business and manufacturing sections of the city. In this department there is also a map, printed in seven colors, showing the different street railroad systems of the city. The articles on street railroad cars and street railroad power stations are particularly valuable, each being written by a prominent engineer of St. Louis. Twenty-three different types of cars now in use on the principal street-car lines in the United States are illustrated and described. Two large groups of portraits are published, one showing representative street railroad managers of St. Louis

and the other the officers and Executive Committee of the American Street Railroad Association.

Messrs John Wiley & Sons, New York, announce as in preparation a field manual for railroad engineers, by Prof. J. C. Nagle.

The Reorganization of Corporations.*

An act passed recently by the Legislature of Kentucky provides that when a railroad or bridge company is insolvent and in the hands of a court the majority of any class of creditors may submit to the court a plan of reorganization, which shall have due regard to the rights of all. The court is to give notice of the plan, and after hearing objections may approve, amend or reject it. If it is assented to by three-fourths of the class proposing it and of those holding subordinate claims, the court shall provide for its execution. If no plan is proposed the court may order a sale, and if security holders buy, it may require them to present a plan of reorganization. Commenting on this law Mr. Storey says:

This legislation is well worthy of careful consideration as a step in the right direction, for it enables the court to protect the interests of investors by making every reorganization the subject of judicial investigation and securing for every interest a hearing. That its importance may be understood, let me for a moment call your attention to the existing practice, of which the country has had a bitter experience within the last few years and of which the railroad cases furnish the most conspicuous examples.

The great railroad systems of this country, with few exceptions, have been built up and equipped with borrowed capital. Their bonds as a rule were issued for money, and to those who held them early in 1893, represented an investment of often more than their face value. The shares of these railroads on the other hand had frequently been issued without payment. Sometimes they were given as a bonus to persons who subscribed for the bonds. Very often a parent company organized subordinate corporations for the purpose of building branches, borrowed the money to build and equip them by issuing the bonds of these corporations, and kept the stock without paying for it in order to control the branches thus built. In this way the money of creditors was invested, and the control of the property was retained by the debtors.

In order to protect these creditors, the most skillful lawyers in the country have been engaged to draw mortgage deeds and other contracts with careful and explicit provisions, defining the rights and remedies of the creditors in case of the debtors' inability to pay its debt, authorizing them through their trustee to take immediate possession and control of the mortgaged property and receive its income, and providing further for speedy foreclosure and sale. Where a great system of railroads has been built up by contracts between independent companies, sometimes in the form of leases and sometimes of traffic agreements whereby one corporation has surrendered to the other the entire control of its property and business in consideration of certain specified payments, the contracts have been carefully guarded so that upon a failure by the corporation in control to make these payments or to observe the stipulations of the agreement, the other should be able immediately to resume possession of its property. These contracts have been shown and their provisions carefully explained to investors when securities were offered to them for sale, and the reputation of the counsel employed has afforded them a guaranty that they could rely upon the rights thus apparently secured. It would be impossible for any lawyer in this body to draw instruments which were clearer or more carefully guarded than many of these agreements.

The last three years have shown us that these contracts cannot be enforced in the courts; that the rights which they are intended to secure are not recognized, and that for all practical purposes the creditor is at the mercy of the debtor and obliged to accept substantially such terms as the debtor chooses to offer. As matters now stand, counsel must advise their clients that they can draw no instrument of this character with the least assurance that its provisions will be respected. Let us see if this statement is not critically accurate.

When a great corporation fails the catastrophe affects especially two classes of persons. One is a small body of men, the managers of the property, who have been charged with the conduct of its affairs and who are in most cases responsible for the result. These men, though often to a limited extent owners, are, as managers, the agents of the owners. The other is a large body of security holders, the real owners of the property, scattered all over the country and often over Europe as well, who have relied upon their contracts, who know nothing of the corporation's condition, nothing of each other, and who, confused by the disaster, are inevitably slow to act. Many of them are persons of small means, of little business experience, and naturally suspicious or timid. They are represented nominally by a trustee, either a trust company or some person often closely connected with the debtor corporation and friendly to its interests, but this trustee while clothed with authority is protected by the trust indenture, so that he is not compelled to act unless requested by a certain portion of the bondholders and amply secured against loss. Before the creditors, therefore, can act for the protection of their interests there must be time for organization; the holders of the bonds must be discovered, representatives must be selected, funds must be provided, and the situation must be carefully studied.

The failure of the railroad company finds the managers united and fully prepared for the emergency which they inevitably have foreseen, while it finds the creditors scattered, ignorant, frightened and entirely unready to act. What has happened in practice? We have seen the managers, while stoutly denying up to the last moment that any such step was contemplated or that the company was in any way embarrassed, secretly prepare a bill in equity and without notice to anyone interested file it in the courts of the United States, asking for the appointment of receivers.

These bills have not been brought by trustees to foreclose any mortgage, for no default has occurred. The plaintiffs have been persons claiming to be stockholders or bondholders of the railroads, or some of them that compose the so-called "system," which has been created and is held together by the contracts of the insolvent company. As a matter of fact, in every case the proceedings have been collusive. The managers of the insolvent company have controlled both sides of the litigation.

*From the address of President Moorfield Storey before the American Bar Association at Saratoga, N. Y., Aug. 19, 1896.

gation; the plaintiff and defendant have been in legal effect the same person, and that person the debtor company. The bills have alleged that this company is unable to meet its obligations, and that there is therefore danger that parties will act upon their legal or equitable rights, that lessors and mortgagees will enter for breach of condition, that railroads worked under traffic contracts will be claimed by their owners, and that therefore the system will be disintegrated and the insolvent company suffer; in a word, that the contingency contemplated in mortgage, lease and traffic contract is about to occur, and that the parties propose to exercise the rights which by the express contract of the insolvent company are secured to them in that very event. Upon this allegation the plaintiffs ask the courts, in the interest of the debtor, to deprive the creditors of these rights or at least to restrain the creditors from exercising them. In brief, the representatives of the debtor ask that the creditors be deprived of that to which they are entitled in order to preserve for the debtor property to which confessedly it is not entitled. The receivership is not sought as incident to other relief, but is the sole and ultimate object of the suit.

Surely this is hardly a prayer entitled to much consideration in a court of justice. No statute passed by Congress or any state legislature to accomplish this result would be sustained for a moment.

To disguise the naked effrontery of this position the bills have generally alleged that the public interest will suffer from the disintegration of the system, but if the public interest did not prevent the making of the contracts it should not prevent their enforcement, even if it were possible under the constitution for courts to take private rights for any such shadowy public use and without any compensation. Practically, however, it may be doubted if there is any foundation for this claim, which certainly has never been established after argument, for no opportunity to litigate it has been given. Where it is for the interest of every one concerned that the railroad should be run and made to earn as much as is possible, there is little danger that the public will suffer from an interruption of service. Connecting roads under different management are worked harmoniously all over the country, and there is no good reason why the same result should not follow even where the connecting roads were once united by a lease or traffic contract.

If, however, we were to admit what has never been decided after argument, that such a suit can be maintained; if we concede that the crisis makes some action by the court expedient; that though the various parties are entitled to their rights, it is necessary that these should be asserted decently and in order and so as to avoid the confusion which might follow the failure of the great corporation; what is the remedy proposed? The court is asked for the protection of all concerned to take the property into its charge and secure to every one his rights, and the method proposed is the appointment of receivers not only of the insolvent corporation's property but of property belonging to various other companies bound to it by contracts which it cannot perform.

The selection of these officers is a matter of the deepest concern to a great many persons. They are to be the trustees for the time being of many different and often conflicting interests and bound to hold the scales with absolute justice between them. They are to be in the graphic language of the decisions "the eyes," "the ears," "the hands" of the court and as absolutely without interest in any of the questions which will confront them as the court itself. They should be men of the highest character and ability, and as impartial "as the lot of humanity will permit." There should not be in the choice of such officers any undue haste. A restraining order will hold everything until after notice and hearing, leaving the property meanwhile to be managed by its officers as before. A temporary receiver, if absolutely necessary, can be appointed like the marshal in bankruptcy cases, but there can be no reason why the creditors, who become by the debtor's failure the virtual owners of the property, should not be heard in the choice of their trustees. Every bankrupt and insolvent law that we have known has left the choice of assignee to the creditors, and the reason for this rule applies equally in the cases we are considering.

The salutary rule of equity has been that, whoever else was selected, the former managers of the property—the representatives of the debtor—must not be made receivers. In the case of a railroad company there is especial reason for this, for these men are inevitably interested and have taken sides on the questions which they must determine. Men who have themselves built up a great system or have been identified in hope and feeling with those who have done so naturally take pride in their work and oppose any step which looks toward its disintegration. Their own position in the railroad world depends on whether they control a system extending over thousands of miles, or a single railroad which is one link in a chain. They and their associates have perhaps lucrative positions which they do not wish to lose. They are in every way deeply interested parties. Having filed a bill for the express purpose of preventing any assertion of legal rights which would dismember the property in their charge, is it possible that when they find this bill entertained and themselves appointed receivers they will not feel themselves charged by the court with the duty of resisting all who would claim such rights? Such men of all others must be disqualified to hold the scales between the conflicting interests which the court must protect. Nor is there any practical reason for their selection. The receiver can employ them, as the corporation employed them, and thus get the benefit of their skill and experience.

It would seem that the justice of these propositions was plain, and they are abundantly sustained by high authority. It is at least clear that in a matter of this supreme importance there is no room for secrecy, and that nothing should be determined *ex parte*. The court should preserve its judicial position; it should hear and then decide. It should not determine without hearing that the allegations in the bill are true, and should not make an appointment which cannot be recalled without embarrassment.

(To be continued.)

TECHNICAL.

Manufacturing and Business.

A meeting of the creditors of the Laconia Car Company, which has recently gone into Receivers' hands, was held at Laconia, N. H., Oct. 29. President Perlev Putman gave a detailed statement of the financial affairs of the corporation, placing the total resources of the concern at \$407,000 and the liabilities \$617,000. Legal complications will delay a compromise with creditors. The following committee was appointed to try to arrange a

settlement: C. B. Gaffney, of Rochester; Gov. C. A. Busiel, of Laconia; A. D. Fessenden, of Townsend, Mass.; John M. Woods, of Boston; Samuel B. Smith, of Laconia, and Harry W. Waite, of Boston.

The Safety Car Heating and Lighting Co., 160 Broadway, New York City, have secured ground having 110 ft. frontage on Second avenue, Pittsburgh, Pa., for the erection of a gas-compressing plant.

The Cleveland Frog & Crossing Co., Cleveland, O., has recently completed and moved into its new iron building, which is 100 x 175 ft. in size.

The Mechanical Railway Signal Co. has been incorporated at Omaha, Neb., with a capital stock of \$1,000,000. The incorporators are B. A. Karr, Lewis A. Woods and Lorenz Koenig.

Mr. J. W. Duntley, President of the Chicago Pneumatic Tool Co., has just returned to this country from Europe, where he has been quite successful in extending the use of the pneumatic tools made by his firm. Although abroad but three months, his sales have amounted to \$30,000. Mr. Duntley visited Germany, France, Russia, Austria and Belgium, besides England, and is now able to say that his tools are used in the shops of all the large railroads of Europe, as well as by nearly 120 of the railroads of this country. The export demand for these tools, particularly from England, has been large since they were first placed on the market, and Mr. Duntley found that every firm and shop where they had been used reported them economical and efficient for the work to be done. The sales included all the sizes of the Boyer pneumatic hammer and the Manning piston air drill and sand papering machine and the pneumatic rivet holder-on, some of these being new tools. While in Europe he cabled for eight compressors, and he believes that there will be a large sale for American air-compressors in Europe. Since he sailed from England cable orders for 20 hammers have been received by his firm. He expects to return in a few months to look after his European business.

The daily newspapers are giving some attention to an order for air-brake equipment for 10,000 cars for the Grand Trunk. This, however, is not a new order. All the negotiations in regard to this contract were concluded at long ago as May, and since then air-brakes have been furnished to the railroad company as required. The work of equipping the cars has been going on steadily and rapidly since then.

The Griffin Wheel Co., of Chicago, has secured control of the American Foundry Co., of South Tacoma, Wash., by the purchase of a controlling interest of the latter's stock. Mr. T. A. Griffin has been elected President of the new company; Mr. J. K. Choate, Manager of the Griffin Company's Denver works, Vice-President, and C. S. Milliken, who has been Secretary of the American Foundry Co., Secretary and Treasurer. Mr. Milliken will be retained as General Manager of the entire plant and J. T. Howson as Superintendent. The building will be enlarged and the present force of 50 men materially increased in the near future.

The Brown Hoisting & Conveying Machine Co., of Cleveland, O., has just completed four of its improved coal hoists and conveyors for the Clybourn Avenue docks of Cox Brothers & Co., at Chicago.

Iron and Steel.

The Illinois Steel Co. is contemplating extensive improvements to its Milwaukee works. At present no steel is produced at the plant, all billets and other steel material being sent from the company's other works. It is intended to erect a basic steel plant, including two blast furnaces. The red fossiliferous ore from Iron Ridge, Wis., will be utilized. The capacity of the present rolling plant is also to be increased. It is said that the proposed additions and improvements will cost about \$600,000.

No. 3 furnace, of the E. & G. Brooke Iron Co., Birdsboro, Pa., was blown in on Oct. 27, after an idleness of eight months. The capacity of the furnace is 700 tons a week; 200 men will be employed.

Hazleton furnace, of the Andrews' Bros. Co., Youngstown, O., has been blown in. The furnace has been idle since June and extensive improvements and additions have been made during that time. It is now expected to turn out from 250 to 300 tons of iron per day.

On Nov. 2 the Bethlehem Iron Co. shipped three 10-in. turret port plates, weighing 109 tons, and 13 10-in. side plates, weighing 166 tons, to the Chief of Port, Sebastopol, Russia, for the new battleship Rostislav.

The structural iron and steel for the new building in Park Row, New York City, will be furnished by the Carnegie Steel Co. The contract will amount to \$500,000.

The Ashland Coal & Iron Co., Ashland, Ky., has recently added a 250-H. P. blowing engine to its plant. This will increase the capacity of its blast furnaces one-third. The output of the furnaces is expected to reach 300 tons per day.

New Stations and Shops.

Division shops, roundhouses and terminals of the St. Louis & San Francisco will be located at Fort Smith, Ark. Contracts amounting to \$100,000 for the erection of the buildings have been let.

Plans have been prepared for rebuilding the roundhouse of the Cincinnati, New Orleans & Texas Pacific at Somerset, Ky., which was burned some few months ago. The roundhouse will be of wood, with 11 stalls for engines, and with shop space occupying about four stalls.

The Georgia Southern & Florida will build new machine shops at Macon, Ga., also a new passenger and freight station at the same place. The plans have been drawn for some little time and were accepted at the meeting of the directors last week. Work will begin at once.

The Central station at Toledo, O., was formally opened on Oct. 24 by a public reception. This station has been built by the Ann Arbor Railroad, and will be jointly occupied by that road and the Flint & Pere Marquette. The building is centrally located, being on the corner of Cherry and Woodruff avenue, near the courthouse. The structure is of the steel skeleton type, fire-proofed finished with dark red pressed brick and trimmed with red sandstone. The lower floor, which is used for waiting-rooms, baggage and toilet rooms, is furnished with marble floors and wainscoting. The upper floors, which are occupied by the general offices of the Ann Arbor road, are finished in quartered oak. The building is heated by hot water, lighted by electricity, and is thoroughly modern in every respect, a credit to its owners and an addition to the city.

The Berlin Iron Bridge Co. has a contract for a car barn 40 ft. x 160 ft. and shop building 33 ft. x 70 ft. for an electric road at Port au Prince, Hayti. These buildings will have a steel skeleton framework covered on the sides and roof with corrugated iron. Many similar buildings have been exported during the past few months by the Berlin Company.

It is stated that the shops of the Ohio River road at Central City, W. Va., will be moved to Kenova in the near future. This will also change the end of the division from Central City to Kenova.

Interlocking.

The Pittsburgh, Cincinnati, Chicago & St. Louis is preparing plans for an interlocking plant at Carnegie, Pa., to have 35 levers. This road now has nine interlocking towers within the first seven miles out of Pittsburgh.

The National Switch and Signal Company has just completed interlocking plants for the Lima Northern Railway at Napoleon and Wauseon, O. A plant of 57 levers is nearly finished at Seattle, Wash., on the Great Northern Railway, while two are under construction on the Chicago & Northwestern. The National Company has the contract for the signal equipment of the Chicago Union Loop.

The new interlocking plant at Clark Junction, near Chicago, was put in service Oct. 29. The signals and switches are controlled by a 42-lever machine, which is also provided with 14 blank spaces. At this point the Chicago, Lake Shore & Eastern is crossed by the Lake Shore & Michigan Southern and the Baltimore & Ohio. Electric locks are used on the derails. The plant was installed by the Union Switch and Signal Company.

New Postal Cars of the Wabash Railroad.

The Wabash Railroad has recently built at its Toledo Shops two postal cars which embody some new features. The cars have no end platforms but are built with a solid vestibule, with chafing plates, which act with the regular vestibules to prevent telescoping in case of accidents. Gould automatic couplers and buffers are used, together with Westinghouse, automatic, quick action air-brakes and train signal. The brake cylinders are 14 in. in diameter and the brakes are applied to all the wheels. The trucks are of the Wabash Standard 6-wheel type, with 33-in. cast-iron wheels, weighing 600 lbs. each. Inside, the cars are equipped with Harrison racks, 68 paper and 510 letter boxes and are lighted by Pintsch gas lamps. The principal dimensions follow:

	Ft. In.
Length of car out to out of end sills.....	60 8 1/2
" " " " " " sheathing.....	60 10
" " " " " " sub-sills.....	62 0
Width " " " " " " side-sills.....	9 10 1/2
" " " " " " sheathing.....	10 0
" " " " " " eaves moulding.....	10 3
" " " " " " upper deck outside of eaves moulding.....	6 2 1/2
" " " " " " end door between posts.....	2 3
" " " " " " side door between posts (mail end).....	2 3
Height from top of sills to bottom of plates.....	6 10
" " " " " " rail to top of upper deck.....	14 7
Distance from center to center of trucks.....	45 5 1/2
" " " " " " of truck to outer face of end sill.....	7 7 1/2
Inside length.....	60 0
" " " " " " width.....	9 3

Boiler Plant for the Ashley Coal Plane.

The Central Railroad of New Jersey has requested bids for renewing the boiler plant belonging to its coal plane No. 2 at Ashley, Pa. This plane is one of three used by that company for hoisting coal out of the Wilkes-Barre District. Water-tube boilers are to be used and about eight batteries are needed with capacity for generating steam to operate 3,500-H. P. engines. The work is to be completed early next spring.

New Ore Docks on Lake Erie.

The Wheeling & Lake Erie has had plans prepared for extensive docks at Huron, O., and it is probable that work will shortly be commenced on construction. It is proposed to use the new docks wholly for ore, using the old docks for coal. The coal and ore shipments of this road have so increased that it has become imperative to provide increased facilities.

David Robison, Jr., of Toledo, O., the builder of the Toledo Electric Street Railroad, has purchased a large tract of land on the east bank of the Maumee River at Toledo, and proposes to erect large mercantile docks and build a short railroad to connect with the Toledo Belt line. It is not probable that work will be commenced before January.

Recent Developments in Armor Plates.

A paper on "Recent Developments and Standards in Armor and Heavy Ordnance" was read before Section G, of

the British Association, at the Liverpool meeting, Sept. 22, 1896. The statement is made that the most important armor tests that have been made in the past two years have taken place in the United States and Germany; that the results in those two countries have been nearly identical, and that a very careful study of the projectiles used is necessary to make an intelligent comparison. The results of trials of those projectiles indicate that the Krupp projectiles used in the tests of the German plates are somewhat inferior to those used at the Indian Head proving grounds, in the United States trials; but at the same time it should be remembered that the German plates were experimental and made to secure the greatest possible resistance, whereas those of the United States were service plates, representing hundreds of tons of armor, from which the inspectors had selected what they considered the poorest of the lot. A careful examination of the results of all these tests has led to the conclusion that first rank must be given to the United States and Germany together in merit of armor plate now produced. A summary of recent advances in the production of armor will include the cheapening and more extensive use of nickel, the substitution of the hydraulic forging press for hammers and rolls, better means of removing scale, simplification of methods; and more uniform results of super-carburization, utilization of the sub-forging process (now required for the United States armor), improved facilities for hardening and improvements in the machines and tools for shaping and finishing.

THE SCRAP HEAP.

Notes.

In Hancock County, Ia., a dining-car conductor of the Chicago, Milwaukee & St. Paul has been indicted for illegal selling of liquors.

The Interstate Commerce Commission will ask the courts to compel the filing of annual reports by such railroads as have neglected to comply with the law requiring reports to be filed by Sept. 15.

Considerable damage to property was done in New Orleans last week Thursday by a cyclone, among other structures damaged being the new grain elevator of the Illinois Central. The damage to this building was, however, not great.

The Southern Pacific lines in Texas have abolished suspensions, "discipline by record" having been put into effect Nov. 1. A similar order on the Pacific Lines of the Southern Pacific was noticed in the *Railroad Gazette* of Aug. 7 last.

The Railroad Commissioners of Alabama have posted in each of the 400 railroad stations in the state an abstract of such laws of the state, governing railroads, as are of interest to the public, or which may suitably be placed in such notice. It appears that the law requiring separate accommodations in passenger cars for white and colored passengers makes an exception for those entering the state from other states where similar laws do not prevail, but is intended to be enforced in cases where a passenger comes from a state in which a separate car law does prevail.

The Legislature of Vermont is now in session and a brave beginning has been made by the introduction of a bill requiring railroads to transport bicycles as baggage. Another bill gives the Railroad Commissioners power to regulate the crossing of steam by electric railroads, apportioning to the state a part of the expense of establishing such crossing. Another bill proposes to modify the law regulating the taxation of railroads and still another provides that decisions of the Railroad Commissioners, in grade-crossing cases, may be appealed to a special commission, to be appointed by the Supreme Court.

New York State Canal Contracts.

Contracts were awarded on Oct. 29, by Superintendent of Public Works George W. Aldridge, for four pieces of work on the western division of the Erie Canal. These contracts come under the \$9,000,000 canal improvement fund, and in themselves aggregate \$883,728. The awards were as follows: For improving the canal from Station 83 x 10, near Ferry street, Buffalo, to Commercial slip, Buffalo, to the Donnelly Contracting Co., of Buffalo, for \$394,955; improving the canal from Station 328, Sec. 21, near McDonald's Culvert, to Station 87 x 10, Sec. 23, near Ferry street, Buffalo, 18 miles, to the Buffalo Dredging Co., for \$291,686.35; improving the canal on Sec. 21, from the head of the Lockport locks to Station 328, near McDonald's Culvert, five miles, to Charles F. Parker & Co., 25 William street, New York City, for \$188,541.75; building the Cartersville waste weir and spillway at Station 721, Sec. 15, to Whitmore, Rauber & Vicinus, of Rochester, for \$8,545.

The Mountain Tamalpais Railway.

The Mill Valley & Mount Tamalpais Scenic Railway begins at a point on the North Pacific Coast Road, in Marin County, Cal., about 60 ft. above tide water. To reach it one takes the Sausalito ferry-boat, at San Francisco, and the cars of the North Pacific Coast Railroad, at Sausalito. The trip to Mill Valley takes 50 minutes, covering a distance of 16 miles, at which point transfer is made to the Mountain Road cars. The length of the mountain line is 8½ miles; gage, 4 ft. 8½ in.; maximum grade, 7 deg.; sharpest curves, 70 ft. radius, and number of curves, 275. The elevation attained is 2,500 ft., which is about 140 ft. below the summit of Tamalpais Peak. Easy trails are made to the summit of the mountain and a fair hotel has been built at the mountain terminus. The road is equipped with one 20-ton Shay locomotive, which did all the construction work, and one 30-ton Heislner locomotive which has not yet been used, and three canopy-covered passenger cars, seating 60 persons each. Construction work was commenced in February, 1896, and the road was first operated Aug. 27, 1896. Two round trips daily and three round trips on Sundays have since been made without any accident of any kind. The

total cost of the road, equipment and hotel has been \$140,000, which has been fully paid up by local capital. It has no bonded indebtedness. The President of the company who conceived the project and took entire charge of the construction is Sydney B. Cushing, and the Secretary, Louis L. Jones, of Mill Valley, Marin County, California. The round trip from San Francisco to Mill Valley and return is 40 cents, and from Mill Valley to the mountain summit and return, \$1.

LOCOMOTIVE BUILDING.

In a newspaper interview with one of the New York directors of the Illinois Central, the statement is made that the Illinois Central Company is considering the purchase of 45 new locomotives.

President Ingalls, of the Chesapeake & Ohio, was reported in the newspapers last week as stating that he had given out a conditional contract for the construction of a number of locomotives. The contract was to be cancelled if Bryan was elected, a possibility which fortunately is no longer to be feared.

CAR BUILDING.

The Central of Georgia has given an order to the Youngstown Car Works for 100 freight cars.

The order of Swift & Co., of Chicago, for 200 cars from the Wells & French Co., Chicago, has been increased to 400.

The St. Louis & San Francisco has awarded contracts for 100 box cars to the St. Charles Car Co., and for 50 refrigerator cars to the Missouri Car & Foundry Co.

The International & Great Northern has just completed at its shops at Palestine the first of six new day coaches, to be used on its fast trains between Texas and the North.

The order of the Armour Packing Co., of Kansas City, for 200 refrigerator cars, which has been talked of since early in the year, will, it is announced, be finally awarded shortly.

The Lehigh Valley is to put on four new Pullman sleepers on its trains between New York and Buffalo. The cars will have 12 sections, a drawing room and smoking compartment.

The shops of the Ohio Falls Car Co., which have been closed for some time, will start up this week on two small orders, 10 tank cars for the Globe Refining Co. of Louisville and a passenger coach for a Louisiana road. No other contracts are on hand.

Cudahy Bros., of Chicago, have made a contract with the Missouri Car & Foundry Co., of St. Louis, for 50 refrigerator cars, to be delivered in 90 days. These cars will be equipped with air-brakes and automatic couplers. All the cars owned by the firm are being overhauled and equipped with safety appliances.

BRIDGE BUILDING.

Fort Worth, Tex.—On the St. Louis & Oklahoma City road, the surveys for which have just been completed, the bridge work will include one 125-ft. span, two 50-ft. plate girders and five 40-ft. plate girders. The balance of the bridging will consist of the usual pile and trestle openings, stone culverts, etc. Mr. L. Lynch, of Fort Worth, is Chief Engineer.

Houston, Tex.—It is stated that the contract for the bridge over Green's Bayou, on the Houston and Crosby road has been let to the George E. King Bridge Co., Des Moines, Ia., on plan No. 1, for \$8,990, their bid on plan 1 being \$3,630. Other bids were: Chicago Bridge and Iron Co., Chicago, plan 1, \$8,000; plan 2, \$3,777; Gillette-Herzog Manufacturing Co., Minneapolis, Min., plan 1, \$7,765; plan 2, \$3,748; Indiana Bridge Co., Muncie, plan 1, \$7,326; plan 2, \$3,630.

Indianapolis, Ind.—The contract for a plate girder bridge across Pleasant Run, on Beecher street, has been given to the Wisconsin Bridge and Iron Co., Milwaukee, at \$2,301. Other bidders were: American Bridge Works, Chicago, \$2,577; Bellefontaine (O.) Bridge and Iron Co., \$2,820; Chicago Bridge and Iron Co., Chicago, \$2,449; Lafayette (Ind.) Bridge Co., \$2,490; Massillon (O.) Bridge Co., \$2,652; Shiffler Bridge Co., Pittsburgh, Pa., \$2,873; Toledo (O.) Bridge Co., \$2,484; Variety Iron Works, Cleveland, O., \$2,714; Wrought Iron Bridge Co., Canton, O., \$2,350.

Knoxville, Ia.—It is stated that bids are asked until Nov. 11 for an iron bridge across the Des Moines River at Red Rock. A. A. Davis, Chairman Board Supervisors, Knoxville, Ia.

Maddington Falls, Que.—The Dominion Bridge Co. has been awarded the contract for a bridge at this place for the Drummond County Railroad. The bridge is to be of steel, and is to cost \$26,000. The structure which this one replaces was carried away by the ice last spring.

Menasha, Wis.—It is stated that the contract for an iron and steel bridge, with stone substructure, 633 ft. long, with an 18-ft. roadway and 7-ft. sidewalks, has been given to the Chicago Bridge & Iron Co., at about \$15,000.

Merrickville, Ont.—A new iron bridge will be built over the Rideau River at this point.

Mill Creek, Pa.—Plans for a 30-ft. segmental arch, to replace the 20 ft. arch culvert over the creek at this place, which was destroyed by high water on Sept. 30, are being made at the office of the Principal Assistant to the Engineer of Maintenance of Way of the Pennsylvania at Altoona. It is proposed to build the new arch to accommodate four tracks.

Quebec, Que.—Mr. W. D. Baillayé, Assistant City Inspector, is receiving tenders for the masonry and ironwork of a swing bridge over the St. Charles River. Plans may be seen at the office of the City Engineer.

St. Johnsville, N. Y.—It is reported that it has been decided to replace the wooden bridge over the Mohawk, at this place, by a two-span steel structure to cost from \$18,000 to \$25,000.

Verzennes, Vt.—The City Council has given the contract for a bridge over Otter Creek to the Berlin Iron Bridge Co., East Berlin, Conn., for \$3,050. Other bids were: Boston (Mass.) Bridge Works, \$2,975; Hawkins' Iron Works, Springfield, Mass., \$2,715; Pittsburg, (Pa.) Bridge Co., \$3,000. The bridge will be built some time during the winter.

Watertown, N. Y.—It is reported that a new bridge at Mill street, to replace the one lately destroyed, will soon be built.

Wausau, Wis.—Plans for a bridge of four spans, each 125 ft., and 100 ft. of iron trestle approach, with a 14-ft. roadway and 6-ft. sidewalks, and foundations of 4-ft.

iron cylinder piers, of 5 in. metal, have been prepared by C. W. Nutter, City Engineer.

RAILROAD LAW—NOTES OF DECISIONS.

Powers, Liabilities and Regulation of Railroads.

In New York it is decided that a street car has no paramount right of way at street crossings.¹

In Georgia the Supreme Court declares that where a railroad, for value, contracted with another railroad company to "interchange business, both through and local," with the latter and its connecting lines, for a specified term, "upon terms as favorable to" the latter "and its connecting lines as those given to any other railroad entering" a designated city, it was bound thereby, not only as to freights shipped from or to points upon its own line, but also as to freights destined to or coming from points beyond the same, and hence could not, so long as it pursued a different and more favorable course as to other roads entering said city, enter into contracts or maintain business relations with transportation companies beyond its own line, with the intention of depriving the road with which it contracted of the benefits of the contract, nor with such intention refuse to receive from the transportation companies shipments of freight routed over said road on bills of lading giving it the benefits of "through rates and through proportions of rates" on such shipments.²

In the Federal Court it is shown that the R. Co. used the U. Co.'s tracks under a contract which provided that the U. Co. should have the exclusive right to make rules for the operation of that part of the railroad used by the parties jointly, and that all trains should move in accordance with the order of superintendent of the U. Co. The court holds that the R. Co., having no right or power to direct the movement of its trains while on the track of the U. Co., could not be held responsible to third parties on the doctrine of respondent superior for any negligence of the men in charge of the train while running over such tracks, though they were in its employ and paid by it.³

The Supreme Court of Pennsylvania rules that municipal consent is requisite to enable any railroad company, whether incorporated by special act of assembly or under the general railroad laws, to enter upon and occupy the public highway of the city, unless its charter contains authority therefor in express terms or by necessary implication.⁴

In California the Supreme Court holds that under the statute providing that "a servant is presumed to have been hired for such length of time as the parties adopt for the estimation of wages, a hiring at a yearly rate is presumed to be for one year," an employment at a stated yearly salary, without other agreement as to the time, constitutes a contract for one year, and this will not be changed by the fact of the monthly payment of salary, nor by the custom of the employer, a railroad company, or of all railroad companies, to employ only by the month.⁵

In Texas it is held that one engaged by a railroad under a verbal contract to remove dead and maimed cattle from the railroad yard, who is paid in the same way and at the same time as laborers generally in the service of the company, and may be discharged in the same way, is not such an independent contractor that the company is exempt from liability for injuries caused by his failure to remove a crippled, but dangerous, steer.⁶

Injuries to Passengers, Employees and Strangers.

In Tennessee it is held that a railroad detective who was authorized to ferret out crimes against the company and who had general instructions not to make arrests without first consulting the local attorneys of the road, but who was authorized to make arrests without such consultation when the proof was clear, and where there was danger of an escape, was acting within the scope of his authority in causing the arrest, without consultation, of a person on a charge of attempting in the presence of such detective, to pass counterfeit money on a station agent in payment for a ticket.⁷

In Kansas it is said that where in an action against a railroad to recover damages for the death of a brakeman killed while making a flying switch, the only negligence charged was that the engineer ran at an unnecessary, unusual and dangerous rate of speed, and the jury found, specially, that at the time of the accident the engineer was under the control of deceased as to the rate of speed, and that he obeyed the signals given by him, a general verdict for plaintiff was erroneous.⁸

In the same state it is ruled that the fact that a rail was being carried on the shoulders of the section men instead of on a hand car, which was the usual method of transporting rails, did not constitute contributory negligence on the part of section men injured thereby, where the rail was light, and was so carried by direction of the section foreman.⁹

In Kentucky it is held that the fact that a station agent whose duty it is to signal trains from the depot platform goes upon the track to follow and stop a train, the engineer of which failed to show that he had seen the signal to stop, and thereby prevent a collision, does not render him a trespasser, so as to relieve the company of liability for injuries to him, unless the employees upon the train actually knew of his presence in time to avoid injury to him.¹⁰

In Kentucky the failure of a railroad to have a man stationed on the rear of a backing freight train, which is being switched, to give warning of its approach, may render it liable for injuries therefrom to other employees upon the track, though the rear car, instead of the usual caboose, was a box car, which did not conveniently admit of this customary precaution.¹¹

In Texas a railroad is liable for injuries to a trespasser injured while attempting to pass between the cars of a train by reason of the sudden starting of the train, if defendant's employees saw and knew of the danger of his position in time to avoid injury to him by the exercise of reasonable care.¹²

In New Jersey it is held that a person traveling with a horse and a vehicle on a street traversed by electric trolley cars has the right to make use of the tracks upon which such cars are propelled, whenever the necessary and customary use of the street requires or permits him to do so; and it is not, per se, contributory negligence for him to turn off from one track into and upon the other track in a street in which double sets of tracks are laid, to allow a car to pass, if while so doing, or while endeavoring to turn back again, he is struck by a car running upon the other track.¹³

¹ Zimmermann v. Union Ry. Co., 38 N. Y. S., 362.

² S. A. L. Belt v. W. & A., 23 S. E. Rep., 845.

³ Atwood v. C. R. I. & P., 72 Fed. Rep., 417.

⁴ Phila. v. R. F., 34 Atl. Rep., 60.

⁵ Rosenberger v. P. C., 43 Pac. Rep., 933.

⁶ T. & P. v. Juneman, 71 Fed. Rep., 939.

⁷ Kieckhefer v. L. & N., 34 S. W. Rep., 219.

⁸ McDermott v. A., 1 S. F., 43 Pac. Rep., 218.

⁹ A. T. & S. F. v. Vincent, 43 Pac. Rep., 251.

¹⁰ Ill. C. v. Mahan, 34 S. W. Rep., 16.

¹¹ I. C. v. Mahan, 34 S. W. Rep., 16.

¹² I. & G. N. v. Tabor, 33 S. W. Rep., 891.

¹³ Con. T. Co. v. Reeves, 34 Atl. Rep., 123.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Cincinnati, Hamilton & Dayton, quarterly, $1\frac{1}{4}$ per cent. on preferred stock, payable Nov. 7.

Pittsburgh, Virginia & Charleston, $2\frac{1}{2}$ per cent., payable Nov. 1.

Kansas City, St. Louis & Chicago, quarterly, $1\frac{1}{2}$ per cent. on guaranteed stock, payable Nov. 2.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Baltimore & Ohio Southwestern, annual, Central Trust Co., New York, Nov. 19.

Buffalo, Rochester & Pittsburgh, annual, Union Trust Co., New York, Nov. 16.

Chicago Junction Railways and Union Stock-Yards Co., annual, Jersey City, Nov. 12.

Central of Georgia, annual, Savannah, Ga., Nov. 10.

Fall Brook, annual, Reading Center, N. Y., Nov. 11.

Lehigh Valley, annual, J. R. Fanshawe, Philadelphia, Pa., Nov. 17.

Manhattan, annual, Mercantile Trust Co., New York, Nov. 11.

Roanoke & Gaston, annual, John H. Sharp, Treasurer, Portsmouth, Va., Nov. 12.

Richmond, Fredericksburg & Potomac, annual, J. B. Winston, Secretary, Nov. 10.

St. Paul & Northern Pacific, special, St. Paul, Minn., Nov. 20.

Santa Fe, Prescott & Phoenix, annual, Prescott, Ariz., Nov. 18.

Savannah, Florida & Western, annual, Savannah, Ga., Nov. 24.

South Carolina & Georgia, annual, Continental Trust Co., New York, Nov. 11.

Spokane Falls & Northern, annual, Spokane, Wash., Nov. 9.

Wilmington & Weldon, annual, Wilmington, N. C., Nov. 18.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Society of Naval Architects and Marine Engineers* will hold its third general meeting at No. 12 West Thirty-first street, New York City, on Nov. 12-13.

The *Railway Signalling Club* will meet on the second Tuesday of the months of January, March, May, September and November, in Chicago.

The *Western Railway Club* meets in Chicago on the third Tuesday of each month, at 2 p. m.

The *New York Railroad Club* meets at 12 West Thirty-first street, New York City, on the third Thursday in each month, at 8 p. m.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Tuesday of each month.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Northwestern Railroad Club* meets at the Ryan Hotel, St. Paul, on the second Tuesday of each month, at 8 p. m.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2:30 p. m.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m.

The *Western Society of Engineers* meets in its rooms on the first Wednesday of each month, at 8 p. m., to hear reports, and for the reading and discussion of papers. The headquarters of the Society are at 1736-1739 Monadnock Block, Chicago.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m., except during July and August.

The *Denver Society of Civil Engineers* meets at 3 Jacobson Block, Denver, Col., on the second Tuesday of each month except during July and August.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7:30 p. m.

The *Engineers' Club of Minneapolis* meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

The *Canadian Society of Civil Engineers* meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday, at 8 p. m.

The *Civil Engineers' Club of Cleveland* meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The *Engineers' Club of Cincinnati* meets at the rooms of the Literary Club, No. 24 West Fourth street, Cincinnati, O., on the third Thursday in each month, at 7:30 p. m. Address P. O. Box 333.

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday each month at 8 p. m.

The *Western Foundrymen's Association* meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. S. T. Johnston, Monadnock Block, Chicago, is secretary.

The *Engineers' Club of Columbus*, (O.), meets at 12 $\frac{1}{2}$ North High street, on the first and third Saturdays from September to June.

The *Engineers' and Architects' Association of Southern California* meets each third Wednesday of the month in the Hall of the Chamber of Commerce, Los Angeles, Cal.

The *Engineers' Society of Western New York* holds regular meetings the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

The *Civil Engineers' Society of St. Paul* meets on the first Monday of each month, except June, July, August and September.

The *Engineers' Society of Western New York* meets on the first Monday of each month at the Society's rooms in the Buffalo Library.

The *Boston Society of Civil Engineers* meets at 715 Tremont Temple, Boston, on the third Wednesday in each month, at 7:30 p. m.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street

and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineering Association of the South* meets on the second Thursday in each month, at 8 p. m. The Association headquarters are at The Cumberland Publishing House, Nashville, Tenn.

The *Engineers' Society of Western Pennsylvania* meets at 410 Penn avenue, Pittsburgh, Pa., on the third Tuesday in each month, at 7:30 p. m.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Association of Engineers of Virginia* holds its formal meetings on the third Wednesday of each month from September to May, inclusive, at 710 Terry Building, Roanoke, at 7 p. m.

Engineers' Society of Western New York.

The regular monthly meeting of the society has been postponed to Monday, Nov. 9, at 8 p. m., and will be held, as usual, at the society's rooms in the Library Building. A paper on "Paving Brick and Brick Pavement" will be read by Mr. H. J. March, M. S. & C. E.

American Society of Civil Engineers.

A regular meeting was held at the Society House, on Wednesday, Nov. 4. A paper by A. H. Sabin, Assoc. M. Am. Soc. C. E., entitled "Experiments on the Protection of Steel and Aluminum Exposed to Sea Water" (see Proceedings for September, 1896, already published) was presented and discussed by several members. The usual collation followed the meeting.

Western Society of Engineers.

A regular meeting of the Western Society of Engineers was held in the society rooms, Monadnock Block, Chicago, on Wednesday, Nov. 4, 1896. There was a considerable discussion on Bedford stone and Louisville cement by several members of the society. Owing to the recent visit of the society to these quarries and cement works, there was a large attendance at the meeting.

The Civil Engineers' Club of Cleveland.

A semi-monthly meeting of the club was held Tuesday evening, Oct. 27, at the rooms in the Case Library Building, Cleveland. Fifty-seven members and visitors present. Mr. Cecil L. Saunders read a paper entitled "Gas Producers and the Mechanical Handling of Fuel." The subject was presented under the following heads: A discussion of various types. The necessity for attention to detail of construction. The relation of character of coal to type to be used. A possible field for future economy. Coal handling from hoppers. Unloading coal by mechanical devices. Messrs. E. A. Sperry, A. Mordecai, J. W. Seaver, C. M. Barber and John McGeorge engaged in an interesting discussion.

Central Railway Club.

The next regular meeting of the Central Railway Club will be held on Friday, Nov. 13, 1896, at the Hotel Iroquois, Buffalo, at 2 p. m., and will be preceded at 10 a. m. by a meeting of the Executive Committee for the consideration of important business. Reports will be submitted on the following subjects:

"What is the Best Plan to Bring About the Adoption of M. C. B. Standards by Railroads?" Committee, A. M. Waitt, G. W. West, R. S. Miller, James Macbeth, William McWood, John S. Lentz.

"Apprentice Boys in Railroad Shops." Committee, John Mackenzie, M. L. Flynn, E. D. Nelson, W. G. Taber, N. Lavery.

"Shall the Cubic Capacity of Ordinary Box Cars be Increased; and if so, What Shall be the Maximum Limit?" Paper by H. H. Perkins.

Discussions will take place on the report of committee on Car Roofs and the report of the Committee on "Comparative First Cost and Cost of Maintenance of Planished Iron Locomotive Boiler Jackets, and the Plain Sheet-Iron or Steel, Painted," also on topical questions submitted by members.

PERSONAL.

—Mr. Frank Julian has been appointed Chief Chemist of the Great Northern Railroad Company.

—Mr. Charles F. Beach, Jr., the well-known corporation lawyer, formerly of New York City, is now established in London, his office being at 16 Great Winchester street.

—Mr. James K. Lyons has been appointed Chief Draftsman of the Carnegie Steel Co., Bridge Department, to fill the vacancy caused by the resignation of Mr. E. K. Scott.

—Traffic Manager Fletcher, of the Kansas City, Fort Scott & Memphis, who was recently selected a member of the Board of Administration of the new Western Freight Traffic Association, has declined the position.

—Mr. C. L. Wellington, General Traffic Manager of the Wisconsin Central, has resigned his position to accept his appointment as member of the Board of Administration of the reorganized Western Freight Association.

—Mr. R. G. Stone, General Freight Agent of the Georgia, Southern & Florida, has resigned that position and he will be succeeded by Mr. J. M. Cutlar, formerly General Southern Agent of the Chicago & Eastern Illinois route, with headquarters at Macon, Ga.

—Mr. B. A. Denmark, of Savannah, has been elected President of the Southwestern Railway to succeed the late President Baxter, of Georgia. Mr. Denmark is a prominent business man of Savannah, has been a director of the Central of Georgia and in recent years actively interested in various railroads of Georgia.

—Mr. William J. Dale, one of the Railroad Commissioners of Massachusetts, was taken suddenly ill while making an official trip over the Boston & Albany about two weeks ago, and has been confined in the Springfield Hospital ever since. He has been unconscious much of the time, and there seems to be some trouble of the brain.

—Mr. A. B. Williams, now Assistant Treasurer of the St. Paul & Duluth, has been elected Secretary and Treasurer to succeed Mr. G. G. Haven, Jr., who has resigned to become a member of the banking-house of Work, Sturgis & Co., one of the oldest banking firms in New York, formerly Work, Strong & Co. Mr. Pierre Jay, of New York, will succeed Mr. Williams as Assistant Secretary and Assistant Treasurer, with headquarters in New York, Mr. Williams' office remaining in St. Paul.

—Mr. Washington Bullard, General Manager for the Union Steamboat Co., one of the Erie affiliated lines, a position which he had held for 23 years, died at Buffalo

last week. Previous to the spring of 1869, Mr. Bullard was agent at Toledo for the steamers of the Erie road. From there he went to Chicago, when the organization of the Union Steamboat Co. was first affected, to take charge of that end of the line. He held this position until 1873, when he was called to Buffalo to assume that of General Manager.

—Gen. Joseph T. Torrence, whose death in Chicago last week is announced, for many years had been one of the most active business men of that city, controlling many iron and steel enterprises and engaged in the construction of several railroads. He organized the Chicago Elevated Terminal Railway Co. in 1891, and published a plan for the construction of elaborate elevated terminals. A large amount of real estate was acquired, but nothing further done, and the franchises and property acquired were sold last year to the Atchison, Topeka & Santa Fe Company.

—The Board of Engineers which is to consider the feasibility of running the trains of the Brooklyn elevated and surface street railroad companies over the New York and Brooklyn Bridge to the New York side has been completed by the appointment of Mr. Virgil G. Bogue and Mr. Geo. H. Thomson. The former was appointed by the Mayor of New York, and the latter by the Mayor of Brooklyn. They are to act with Mr. L. I. Buck, whose appointment on the Board by the President of the Bridge Trustees was announced last week and Mr. C. C. Martin the Chief Engineer of the bridge.

—Mr. Henry K. McHarg has been elected President of the Atlanta, Knoxville & Northern, which has been organized to succeed the Marietta & North Georgia road, and took over the property of that company on Nov. 1. Mr. McHarg is Vice-President of the Manhattan Bank, in New York, President of the Texas Central Railroad, a director of the Wabash, and a man of considerable wealth and ability. The Vice-President of the new company is Mr. E. C. Spalding, President and General Manager of the Southern Iron Car Line, and a railroad officer of long experience. The General Manager is Mr. Joseph McWilliams, formerly Superintendent of the Texas Central road. The new owners propose to put the line in good physical condition. It is about 230 miles long, connecting Atlanta and Knoxville, and should be an important line.

ELECTIONS AND APPOINTMENTS

Atlanta, Knoxville & Northern.—This company assumed possession and operation of the Marietta & North Georgia Nov. 1, 1896. The following elections and appointments are announced: Henry K. McHarg, President, 40 Wall street, New York, N. Y.; Eugene C. Spalding, Vice-President, Atlanta, Ga.; H. W. Oliver, Secretary, Treasurer and Auditor, Marietta, Ga.; Joseph McWilliams, General Manager, Marietta, and W. B. Bradley, General Freight and Passenger Agent, Knoxville, Tenn.

Bangor & Aroostook.—The annual meeting of the stockholders was held in Bangor last week. These officers were elected: A. A. Burleigh, President; F. W. Cram, Vice-President and General Manager; Edward Stetson, Treasurer; F. H. Appleton, Clerk; A. A. Burleigh, B. B. Thatcher, C. A. Gibson, Edward Stetson, H. P. Oliver, F. W. Cram and F. H. Appleton, Directors.

Cleveland, Cincinnati, Chicago & St. Louis.—The annual meeting of stockholders was held at Cincinnati, Oct. 28. There were 69,411 shares of preferred stock and 166,077 of common stock voted for. The following directors were re-elected for three years: James D. Layne, George T. Bliss and H. McK. Twombly, of New York; John T. Dye, of Indianapolis; and W. T. Anderson, of Rhode Island.

Huntingdon & Broad Top Mountain.—William W. Noble has been appointed Purchasing Agent and Paymaster, vice S. B. Knight, resigned.

Indiana & Illinois Southern.—F. E. Basler has been appointed General Freight and Passenger Agent, with headquarters at Sullivan, vice Charles P. Walker, General Freight Agent, and Murray D. Crawley, General Passenger and Baggage Agent, transferred.

Maricopa & Phoenix.—W. J. Cotton is now General Freight Agent, and R. L. Blackman General Passenger Agent with headquarters at Phoenix, Ariz.

Mexican Central.—Mr. George C. Sperry has been appointed Superintendent of Telegraph, with headquarters at the City of Mexico. Mr. Sperry will have direct charge of all matters pertaining to that department except revenue, which will remain with the Traffic Department as heretofore.

St. Louis Southwestern.—George Erbeling has been elected Secretary, vice J. C. Otteson. J. M. Scroggins has been elected Master Mechanic of the St. Louis Southwestern Railway of Texas, vice Thomas Inglis.

Tabor & Northern.—H. T. Woods has been elected General Manager.

Texas Midland.—F. W. Fratt is now Superintendent, with offices at Terrell, Tex.

Unadilla Valley.—B. W. Appleton has resigned as General Freight and Passenger Agent, and the duties of these offices will be performed by the General Manager, Frederick F. Culver. Mr. Appleton still retains his office as Treasurer.

RAILROAD CONSTRUCTION.

Incorporations, Surveys, Etc.

Ann Arbor.—On Oct. 20 the company commenced to operate the new Ann Arbor Whitmore Lake Cutoff, which has been built this season by A. McArthur & Co., of Chicago, contractors, under the direction of Mr. John White, Engineer. The location was made in 1895 by H. E. Riggs, then Chief Engineer. The total length of the new line is $7\frac{1}{2}$ miles, saving $2\frac{1}{2}$ miles in distance over the old line. The total curvature on the new line is 185 deg. 7 min., saving 244 deg. 46 min. The maximum curvature of new line is 2 deg.; on the old line was 6 deg. The grades on the old and the new lines are shown below:

	Old line.	New line.	Saving.
Against southbound traffic—total rise, ft.	138.5	48	90.5
" northbound "	215.5	155	90.5
Maximum grade, southbound, ft. per mile.	165.6	30	
" northbound, "	79.2	40	

Bangor & Aroostook.—It is stated that active work is likely to be begun shortly on the proposed extension of the road from its present northern terminus at Cariboo to Van Buren on the Aroostook River, which divides Maine from New Brunswick. This line was surveyed when the other divisions of the road were built, but nothing more had been done, as its construction was not

pressing. The line will be about 22 miles long and will be almost directly north through a country easy for railroad building. The present survey would require heavy work on the northern end of the line, and it is likely that the location will be revised, the new line going about seven miles west of the present route.

Collins & Reidsville.—This road is in operation from Reidsville, Ga., to Collins, a distance of seven miles.

Columbia River & Red Mountain.—Edward J. Roberts, Chief Engineer of the Spokane Falls & Northern road, of which the above line is an extension into British Columbia, spoke last week as follows in reference to the construction of the new road: "That part south of the international line is virtually completed, while the Red Mountain division will have three miles of track laid this week. Four large bridges are to be built yet, to say nothing of the one across the Columbia, which will be not far from a third of a mile long, and will cost about as much as all the rest of the road. The road when completed will be 16½ miles long, and in that distance the elevation is 2,300 ft. The work will be completed in November, with the exception of the bridge across the Columbia, which will be built during the winter. In the meantime a large cable ferry will be used. We expect all the traffic we can handle upon the completion of the road, and although the Le Roi and War Eagle mines are the only constant shippers at present, there are from six to a dozen others that are in shape to ship, and will begin upon the completion of our road."

Delaware & Hudson.—The second track is now complete from Harpursville to Delanson, a distance of 93 miles. The double track between Ninevah and Harpursville, N. Y., was completed a few weeks ago, on the last section.

Florida Western.—Active work has been begun on this road between Carrabelle, Ga., and Appalachicola, Fla., and contractor R. L. Bennet, of Tallahassee, Fla., has 150 men engaged on the work. The road will connect at Carrabelle, with the Carrabelle, Tallahassee & Georgia, extending to Thomasville, Ga.

Hazelhurst & Southeastern.—The Marsh Lake Branch of this road has been opened for business from Richardson, Wis., to Marsh Lake, a distance of eight miles.

Hutchinson & Southern.—On the extension from Cameron, Kas., to a junction with the Chicago, Rock Island & Pacific at Medford, O. T., five miles of track has been laid, all bridging is about completed, 13 miles of grading done, and the line will be in operation by Dec. 1.

Kickapoo Valley & Northern.—This road has been extended from Soldiers' Grove, Wis., to Readstown, a distance of five miles.

Mississippi & LaFourche.—The first section of five miles from La Pice station, on the Texas & Pacific, in St. James Parish, La., has been completed, and freight is now being carried over the new line. Mr. R. W. Edwards, President of the company, proposes to extend the road successively to Klotzville, Napoleonville and LaFourche Crossing.

New York & Pennsylvania.—It is expected that before November regular train service will begin, the road being now nearly completed to Canisteo, N. Y. The grading has been completed and the rails have been laid from the Pennsylvania terminus to the long bridge near Canisteo. An agreement has been made with the Erie road for running rights from Canisteo into Hornellsville over the Erie's tracks. Yards and round-house facilities have been provided in Hornellsville and two regular trains will be run between the latter place and Oswayo, Pa., the southern terminus, in each direction daily.

Northern New York.—It is hoped that active work on the proposed extension of its southern terminus at Tupper Lake, 20 miles south to Long Lake, N. Y., will begin before January. A connection will ultimately be made from Long Lake with the Delaware & Hudson at North Creek, Saratoga County. These extensions will open up all the lower part of the Adirondack Mountains.

Northern Ohio.—General Superintendent Hill states that on Nov. 1, 100 miles of the line had been rebalasted with gravel and in addition a number of fills made, as well as culverts and bridges built. The road has been so improved that the running time has been materially reduced. It is probable that the three steam shovels will be kept in operation all winter, or as much of the winter as is possible. Most of the other work will be closed down Nov. 1. This road was formerly the Pittsburgh, Akron & Western, and is now being operated by the Lake Erie & Western.

Ottawa, Arnprior & Parry Sound.—President Booth and General Manager Chamberlain, of the Canada Atlantic, of which this road is an extension to Parry Sound, have recently completed a tour over the new line, and report that the line will be completed through to Parry Sound this month, and that the formal opening will take place before December. At present only five miles of track remain to be built to complete this through line between Ottawa and Parry Sound. The new line begins at the terminus of the Canada Atlantic at Pembroke, and extends through a great tract of unoccupied but valuable timber land, to Parry Sound, where it will connect with the boats of the Georgian Bay Steamship Line. The new road is expected to give a very large traffic, chiefly in lumber, to the Canada Atlantic, freight being carried over that line into Ottawa.

St. Joseph Valley.—Work on the new line from Buchanan to Benton Harbor, Mich., is reported to be rapidly going ahead, many additional men and teams having been secured from Chicago. All the material for the construction of the proposed line is now on the ground, and the promoters hope to have the road in condition for running trains by Jan. 1.

Seaboard Air Line.—The extension of this company's line from Cheraw, S. C., to Columbia, via Kershaw and Camden, is expected to begin soon after the new management takes hold, it is stated, as the extension has been definitely agreed on.

Sherman & Patten.—President A. A. Burleigh is reported as stating that an extension of the line now in operation between Sherman, a station on the Bangor & Aroostock, and Patten, six miles, is likely to be built. The line will go through pine and other timber lands, and a special charter will be applied for at the next legislature to build a lumber line as far as Chamberlain Lake. The existing line is operated under the general railroad laws, but the new road will only be used for lumber operations.

Western New York & Pennsylvania.—Passenger

service on the branch between Titusville and Lakeville, Pittsburgh Division, has been discontinued.

Electric Railroad Construction.

Aurora, Ill.—The Aurora & Geneva Railway Co. was chartered July 29 with the following officers: Mr. William Fahnestock, President; R. B. Dobson, Treasurer, 2 Wall street, New York City; D. A. Belden, Secretary and General Manager, Aurora, Ill. The line joins Aurora, North Aurora and Batavia. It is built on the side of the highway which connects these three cities, and will be extended to Geneva, the county seat of Kane County, next spring. The distance to Batavia from Aurora is seven miles, and to Geneva, the terminus, from Aurora, 10 miles. The population served will be 33,000. The line parallels the right of way of the C. & N. W. R. R. Co. The line is built and in operation to Batavia, with three miles to build to Geneva in the spring. There will be no contracts for grading or track-laying let. "T" rails (60 lb. to the yard, and 60 ft. lengths) will be used. Ties 2 ft. between centers, 6 ft. x 8 in. x 8 in. cedar and white oak are used. Road-bed ballasted entire distance with best quality gravel, and no grades will exceed 2½ per cent. Power is furnished by the Aurora Street Railway Co. from its power-house in Aurora, which has an equipment of 1,000 H. P. Babcock & Wilcox boilers; 950 H. P. Straight Line engines; 700 kw. capacity Edison generators will form a part of the apparatus. One through girder bridge, 50 ft. long will be placed over Mill Creek bridge, built to carry 40 tons (moving load). The money is furnished through subscription to capital stock mainly held by Fahnestock & Co. No. 2 Wall street. There are no bonds or indebtedness. The line was opened to Batavia for business Oct. 24. Double track cars, 36 ft. long, furnished with G. E. 1,000 motors, are used. The road will be extended the remaining three miles from Batavia to Geneva early next spring, connecting with the Carpentersville, Elgin & Aurora Railway, the southern terminus of which is at Geneva. There will then be a continuous electric line from the north to the south limits of Kane County, along the Fox River, connecting cities and villages of Carpentersville, Dundee, Elgin, South Elgin, St. Charles, Geneva, Batavia, North Aurora and Aurora, a total distance of 27 miles, with a population of over 60,000.

Bradford, Pa.—It is reported that a Boston syndicate has purchased the old narrow-gauge right of way between this city and Olean, N. Y., from the Western New York & Pennsylvania, and will construct an electric line at once.

Bristol, Pa.—We have been informed that the Bristol & Langhorne Trolley Co. will extend its lines through Newportville, Emille and Fallsington to Trenton.

Carlisle, Pa.—Work on the extension of the electric line to Boiling Springs will be completed in about two weeks, and the tracks in Carlisle have been removed from York to East High street. Before long, the line is to be further extended to Mount Holly Springs.

Cleveland, O.—The Cleveland & Southern Electric Railway Co. has been incorporated with a capital stock of \$10,000 by Hon. H. C. Masson, F. L. Taft and others of Cleveland, to build an electric railroad through Cuyahoga, Media, Summit and Stark counties.

Harrisburg, Pa.—The traction company will build a new brick car barn, to replace the frame structure destroyed by the wind on Sept. 29.

Hazleton, Pa.—It is stated that the Lehigh Traction Co., of Hazleton, and the Wyoming Valley Traction Co., of Wilkes-Barre are interested in a scheme to build an electric line between Wilkes-Barre & Milnesville, the terminus of a branch of the local lines to run along the right of the Lehigh Valley Railroad for some distance in the upper end. The total length will be about 23 miles. Work is to be commenced in the spring. The grades will not exceed three per cent. at any point.

Lewiston, Me.—We are informed that the Lewiston & Auburn electric railroad may be extended to Minot and Mechanic Falls, and eventually to connect with the Norway & South Paris electric road.

Millvale, Pa.—The Millvale & Etna Street Railway Co. has been granted permission by Millvale authorities to place a double track on its line through that village.

Montreal, Can.—The Montreal Street Railway Co. is pushing the construction of its Guy Street and Cote des Neiges line. The laying of the rails has commenced on the Point St. Charles end of the route, one track having already been built on Shearer, between Centre and William streets. The new power-house at Pointe aux Trembles, half way between Maisonneuve and the eastern terminus, is about completed. The two Goldie & McCulloch's engines of 300-H. P. are all ready for work. The walls are built of Crown pressed brick, and metallic shingles have been used for the roof. The roadbed and track-laying has been completed to Ontario street, and a connection made with the lines of the Montreal Street Railway Co. The trolley poles, all of which are of cedar, have been erected on the entire line, a distance of about 12 miles. The wire has been strung to Maisonneuve, and splendidly finished cars, six in number, made by the Peterboro Canadian General Electric Co. have been built. These cars will reach the city in a few days. Fifty-six-pound T-rails have been used. The company has a permanent wharf at Bout de l'Isle.

New Haven, Conn.—On Oct. 26, the Fair Haven & Westville Railroad Co. began double-tracking its line from West Chapel street, at Norton, out Derby avenue, to the Yale field. The work will be under the charge of John C. Punderford, engineer of the road.

Blakeslee & Son, contractors, completed the construction of the Manufacturers' Street Railroad on Oct. 25. This road has been in the course of construction since last July. The road is the first electric line built for the transportation of freight in the state. The electric locomotive which has been ordered by the railroad company from the General Electric Co. is to be shipped from Schenectady, N. Y., very soon. The electric power is to be supplied by the Fair Haven & Westville Railroad Co. The engineering work was done under the supervision of former City Engineer Hill and has cost about \$25,000.

Pittsburgh, Pa.—The Consolidated Traction Co. has begun to remove the old rails on the Sharpesburg branch and put in the new heavy rails.

Rockville, Conn.—The committee of the common council, appointed several weeks ago to investigate and report on the petition of the Rockville & Ellington Street Railway Co., to lay tracks in the city limits, recommends that the railroad must be a single-track, beginning at a point on the east of Snipsa street, thence along to East Main through Market and Brooklyn streets and then passing over many other of the principal

streets. The poles are to be of iron, which will also be used to carry the electric-light wires. The track is to be a 7-in. girder rail. One thousand dollars yearly shall be paid to the city.

Rutherford, N. J.—The road of Union Traction Co., from Newark through Arlington, Lyndhurst, Rutherford, E. Rutherford, Carlstadt, Woodbridge, Hasbrouck Heights to Hackensack is under construction, all contracts being under way, and the road will be in operation this winter. The power-house is located at Rutherford and is mostly completed. The road fills an urgent demand for a cross-country electric road through this territory, and is being built in the best possible manner. The officers of the company are: H. C. Adams, President; H. H. Copeland, Treasurer; F. Bourne, Secretary; C. J. Field, Chief Engineer.

Shamokin, Pa.—A route has been selected for the extension of the Shamokin & Mt. Carmel Electric Railroad from Ashland to Centralia. Work will be commenced as soon as the rights of way can be obtained. The new route will be from Centralia to the North Ashland colliery, thence to the Bast colliery and from there to Big Mine Run, about a mile east of Ashland, where a connection will be made with the Schuylkill Traction line. The distance will be about 2½ miles, with a four per cent. grade.

Springfield, Mass.—The Springfield & Southwestern Electric Railway Co., which proposes to build a street railroad from Springfield, through West Springfield and Agawan, to Suffield, Conn., has been granted a location by the Selectmen of West Springfield, on condition that the company shall contribute \$125,000 toward the construction of a new bridge across the Connecticut River between Springfield and West Springfield. It is estimated that a bridge, on the location of the present wooden structure, will cost \$150,000 or more. It is understood that the company is ready to pay \$125,000 as soon as it shall have secured right of way in the other towns. In Agawan, a franchise on the proposed route has already been granted to the West Springfield, Agawan & Suffield Company, and it will probably be necessary to make some arrangement with that company in order to secure the desired right of way. The building of the Southwestern line will also necessitate the construction of a new bridge across the Westfield River.

Springfield, Vt.—The Springfield Electric Railway Co., which will build an electric road from Springfield, Vt., to Charleston, N. H., a distance of 7½ miles, referred to in our construction notes July 24, has finished all the grading, and the overhead work will be completed in about four weeks. The General Electric Company will supply the generators and motors and the Jackson & Sharpe Company the cars. W. H. Slack, of Springfield, Vt., will have charge of the erection of the power plant, and the track and overhead work is under the direction of Fred H. Ley & Co.

Steeleton, Pa.—The Citizens' Passenger Railway Co., which is operated by the Harrisburgh Traction Co., has been granted consent to operate an extension of its line on various streets of Steeleton.

Stockton, N. J.—A large force of men are at work at Stockton, on the River road, extending the lines of the Camden & Suburban Railway Co. from State street to Cooper avenue.

Trenton, N. J.—The East Penn Traction Co. will construct an electric line from Trenton to Willow Grove by Jan. 1. Surveys have been made.

Uniontown, Pa.—Rights of way have been secured, and the contractors have begun work on the extension of the line of the Uniontown Street Railroad to Brownfield. The new line will parallel the Baltimore & Ohio on the east side.

The Uniontown Street Railway Co. has been granted the right of way from Uniontown to Brownfield.

White Plains, N. Y.—It is reported that the New York, Elmsford & White Plains Railway Co. will soon give the contracts for the proposed extension of the electric road from Elmsford to Tarrytown.

GENERAL RAILROAD NEWS.

Atchison, Topeka & Santa Fe.—Earnings are reported as follows:

Month of September:				
	1896.	1895.	Inc. or dec.	
Gross earn	\$2,705,718	\$2,358,210	I.	\$347,507
Oper. exp.	1,857,937	1,969,516	D.	111,579
Net earn	847,781	388,694	I.	459,087
Aver. oper. mileage....	6,435	6,481	D.	46
Three months, to September 30:				
Gross earn	\$7,350,201	\$6,802,509	I.	\$547,691
Oper. exp.	5,266,478	5,817,051	D.	550,573
Net earn	2,083,723	985,458	I.	1,098,265
Aver. oper. mileage....	6,435	6,481	D.	46

Atlanta, Knoxville & Northern.—The purchasers of the Marietta & North Georgia road have paid another installment of \$100,000 of the purchase money and have taken possession of the property. They have formed a new company and the road will hereafter be known as the Atlanta, Knoxville & Northern, as previously announced. Henry K. McHarg, of New York, is President, and Eugene G. Spalding, of Atlanta, Vice-President.

Baltimore & Ohio.—The Mercantile Trust Co., of New York, and Messrs. George F. Crane, George C. Jenkins and James Bond, trustees, have filed their answers in the United States Circuit Court to the suit instituted by the Johns Hopkins University to compel the receivers to continue paying the annual dividend of 6 per cent. on the preferred stock. In their answer to the suit the receivers suggested that the trustees should be required to answer it, and an order to that effect was passed by the court. The answer of the Mercantile Trust Co. is similar to that of the receivers. It traces the early financial history of the Baltimore & Ohio Railroad, and concludes with the assertion that the Johns Hopkins University "will be entitled to no payment on account of the stock held by it out of the property or income in the hands of the receivers until the claims of all the creditors of the company who are entitled to demand payment are fully paid and discharged."

Chesapeake & Ohio.—The earnings in September were:

	1896.	1895.	1894.
Gross earn	\$369,854	\$331,510	\$759,304
Oper. exp.	570,499	501,258	526,362
Net earn	\$299,355	\$270,251	\$232,942
P. c. exp. to earn	65%	67%	66%
Gross 3 mos.	2,572,165	2,478,298	2,534,144
Net earn 3 mos.	894,089	815,267	894,053
Net earnings in September, 1893, were \$320,653; in 1892, \$304,634; in 1891, \$240,033; in 1890, \$190,255.			

Chicago, Hammond & Western.—The stockholders have been asked to meet on Jan. 4 to authorize the issue of securities amounting to \$2,500,000, to be used in paying for construction, completing and improving the railroad.

Cleveland, Cincinnati, Chicago & St. Louis.—The company makes the following report for September:

	1896.	1895.	1894.
Gross earn.....	\$1,122,256	\$1,238,527	\$1,205,676
Oper. exp.....	831,685	876,694	857,158
Net earn.....	\$291,571	\$361,833	\$348,518
P. c. exp. to earn.....	74	704	714
Fixed charges.....	238,792	279,918	238,628
Surplus.....	\$52,779	\$121,915	\$169,890
Net 3 mos.....	829,618	967,976	780,833

Net earnings in September, 1893, were \$235,150, in 1892, \$401,367; in 1891, \$432,332; in 1890, \$389,769.

Eric.—The company reports the operations of its entire system for September as follows:

	1896.	1895.	Inc. or dec.
Gross earn.....	\$2,769,490	\$2,775,428	D. \$5,938
Oper. exp.....	1,936,932	2,016,413	D. 79,541
Net earn.....	\$832,558	\$758,955	I. \$73,603
From Dec. 1 to Sept. 30:			
Gross earn.....	\$95,097,232	\$94,216,146	I. \$881,086
Oper. exp.....	18,630,307	18,298,991	I. 331,316
Net earn.....	\$6,466,925	\$5,957,155	I. \$509,770

In the above statement the proportionate amount of the taxes for the current year are included in operating expenses.

Fort Worth & Rio Grande.—The company has filed a motion in the State Court at Fort Worth, Tex., to dismiss the receivership. Judge Green made an order for the Receiver to pay over \$200,000 to the company to enable it to fully comply with its agreement, and as soon as the auditing of the accounts can be completed the receivership will be finally terminated.

Great Salt Lake & Hot Springs.—This road, from Salt Lake to Farmington, Utah, was sold last week under foreclosure for \$70,000. The road was bought in by the Salt Lake & Ogden Railway Company for the amount of the judgment, the new company being a reorganization of the old one. In the new company C. K. Bannister, of Ogden, General Manager of the Pioneer Electric Power Co., is President, Simon Bamberger is Vice-President and Manager, and E. W. Duncan is Treasurer. These officers also own a large majority of the stock. The road will be extended as rapidly as possible in the direction of Ogden. It is intended to equip it for electric operation with power from the Ogden power dam as soon as that project is completed. The line is about 15 miles long, and was built a few years ago, Simon Bamberger being the Manager.

Gulf & Interstate.—L. P. Featherstone, General Manager of this company, has recently concluded a contract with the Galveston County Commissioners for the approaches for the proposed Bolivar ferry, to be operated between the city of Galveston, across Galveston Bay to Bolivar Point on the main land, and the terminus of the Gulf & Interstate road. The contract price is \$53,900 and the ferry is to be used jointly for railroad and public purposes. The railroad is 70 miles long, extending through Eastern Texas to Beaumont, near the Neches River, where connection is made with the Southern Pacific line to New Orleans. When the ferry is in operation the cars will be carried on transfer boats across the bay to the city of Galveston.

Nashville, Chattanooga & St. Louis.—The Directors of the company have decided to pass the quarterly dividend usually paid in November. The road has a floating debt, whose holders are pressing for payment, and the Directors therefore do not think it wise to borrow the money to pay the dividend of 1 per cent. The company's balance sheet following, as of June 30, shows bills payable of \$1,260,000.

New England.—At the recent annual meeting of the stockholders at Hartford, Conn., President C. P. Clark made an address to the stockholders in which he said that by the sale of the old station site of the New England in Boston to the Boston Union Terminal Co. for \$2,000,000, a large sum of money would be available for improving the freight facilities of the road. He said that the prospects of the line had greatly improved in the past year. The stockholders voted to ratify the lease of the Providence & Springfield line made last January by the directors, the lease being for 103 years at four per cent. on the capital of the road, which is \$530,000.

North Carolina.—The North Carolina State Farmers' Alliance has filed the necessary legal notice that the Alliance will make application to the next legislature (which assembles in January) for an investigation into the recent lease of this road for 99 years to the Southern Railway Company, and for such legislation as will bring the matter properly before the courts of the state in order that the validity of the lease may be adjudicated. This is a revival of the attempt made by the Farmers' Alliance nearly a year ago to vitiate the lease. The two suits then entered against the Southern fell through—one of them being voluntarily withdrawn by the prosecutors. First Vice-President A. B. Andrews, of Raleigh, said this week that the suits were not important, insisting that the lease is valid. The Southern, under the new lease, is paying and will pay considerably more rental than under the old one, under which it (the old Richmond & Danville) operated the property for 24 years at an annual rental of less than six per cent. Now the Southern pays the equivalent of 6½ per cent. for the first five years on \$4,000,000, and seven per cent. thereafter. The private stockholders, who own about one-fourth the stock, are satisfied with the new lease, as were the directors on the part of the state who made the lease. The directors who made the lease were Democrats, the Populists not then being in power.

Philadelphia & Reading.—The earnings of the railroad company in September were:

	1896.	1895.	1894.
Gross earn.....	\$1,801,833	\$1,931,561	\$1,785,150
Oper. exp.....	925,073	1,018,656	962,927
Net earn.....	\$876,760	\$912,905	\$822,223
P. c. exp. to earn.....	514	524	534
Total income.....	911,401	967,391	840,396
Surplus.....	38,105	167,413	Def 301,061
Net earn. 10 mos.....	7,119,608	7,392,488	7,040,239
Def. 10 mos.....	1,150,049	350,275	1,498,076

The charges for the 10 months of the present fiscal year include \$1,380,824 of equipment payments, of which \$520,000 Car Trust certificates matured during the year 1894 and 1895, and are not properly chargeable to the business of 1896.

The returns of the coal and iron company show:

	1896.	1895.	1894.
Gross receipts.....	\$2,171,411	\$2,345,260	\$1,793,093
Total exp.....	2,065,789	2,551,934	1,805,555
Profit.....	\$105,622	Loss \$206,694	Loss \$12,522
Charges.....	95,000	95,000	122,209
Surplus.....	\$10,622	Def. \$301,694	Def. \$134,731
Loss 10 mos.....	268,710	\$694,463	Prof. 94,035
Def. 10 mos.....	1,218,710	1,699,463	1,086,390

Oregon Short Line & Utah Northern.—The American Loan & Trust Co. has filed an application for permission to foreclose and sell the road. This is virtually the first important step taken looking to the sale of the line and its separation from the Union Pacific system. The Reorganization Committee, formed several months ago, has made such progress that after the granting of the petition of the Trust Company the road will be foreclosed at once and bid in by the bondholders and then the reorganization plans will be put into operation.

Roanoke & Southern.—On Nov. 24 at Roanoke, Va., this road, which for several years has been operated under lease as a division of the Norfolk & Western, will be sold by order of court by the special masters, Charles Sharp and G. E. Bowden. The upset price is \$500,000, and no bid for less than that sum will be entertained. It is understood that the new owners of the Norfolk & Western will secure the property without opposition.

Rutland.—The annual report contains the following remarks on the breaking off of relations with the Central Vermont, after that road went into a receivership: On March 20 the Central Vermont, the lessee of the Rutland Railroad and property, went into the hands of receivers appointed by the United States Circuit Court. The rent which had been promptly paid prior to that time was not paid upon the last day of March when due. The officers of your company immediately made application to the court for a prompt payment of the rent, and on May 5 the Circuit Court declined to order payment of the rent, but ordered that the officers might enter upon and take possession of the company's property May 7. Upon this order your officers took possession of the road and property, and since that time have been operating it. The Chancellor also ordered the payment to the Rutland Co. by the Receivers of the rental due and unpaid to March 20. The amount of rental still due and unpaid from March 20 to May 7 is undetermined and is represented in the statement of the Treasurer by item \$47,777. The company being without officers or an organization adequate to the operation of the road, no doubt suffered some loss at the start on that account. The rolling stock had suffered considerable depreciation while in the hands of the lessee, and the buildings also had not been maintained, but the track and the roadbed were in good condition.

The balance sheet, July 1, 1896, shows:

Liabilities.	Assets.
Common stock.....\$2,480,600	Construction acct.....\$7,533,422
Preferred stock.....1,239,100	Stocks and bonds.....438,567
First mort. bonds, 6%.....1,464,100	Real estate.....134,428
Second mort. bonds, 5%.....1,430,900	Stock and equipment.....2,004,752
Con. mort. bonds, 4%.....605,000	Central Vt. R.R. Co.....47,777
Notes payable.....45,000	Roanoke & Southern R.R. Co.....47,777
Unpaid dividends.....2,982	Accounts receivable.....48,735
Coupons unpaid.....9,873	Profit and loss.....57,806
Accounts payable.....30,112	Cash.....22,821
Pay-roll acct., June.....21,460	
Total.....\$10,329,129	Total.....\$10,329,129

Seaboard & Roanoke.—No public change in the management of the road has yet been made, but newspaper interest in the future of the property still continues, and is responsible for a great variety of statements. One that the New York interest had failed to meet payments in the stock purchased was promptly denied. The following is said to be published by authority of the purchasers: There is no trouble whatever in the negotiations for the change in control of the Seaboard Air Line. The control of about 8,300 shares of the Seaboard & Roanoke stock will be transferred to Mr. J. F. Ryan before Nov. 15. The question of money has never once entered into the affair and the reports circulated of alleged hitches and the like are groundless. The McLane pool has entered into with Mr. Ryan, and the control will pass into Mr. Ryan's hands before Nov. 15. On the same authority the statement is made that Mr. Ryan has acquired the control of the road for himself and in the purchase of the property he stands alone.

Electric Railroad News.

Albany, N. Y.—The Oneonta Street Railroad Co. has purchased the building formerly occupied by the Mineral Paint Co., on Mechanic street, which will be converted into a carhouse and power station.

Brooklyn, N. Y.—Brooklyn Heights reports its earnings for the three months ending Sept. 30, 1896, as below:

	1896.	1895.	Inc. or dec.
Gross earn. from oper.....	\$1,189,871	\$1,150,285	I. \$39,586
Oper. exp. (exc. taxes).....	673,506	638,362	I. 35,144
Net earn.....	\$516,365	\$511,923	I. \$4,442
Income from other sources.....	61,326	54,788	I. 6,538
Gross income.....	\$577,691	\$566,711	I. \$10,980
Fixed charges.....	505,946	516,726	D. 10,780
Surplus.....	\$71,745	\$49,985	I. \$21,760

Burlington, Ia.—Articles of incorporation of the Burlington Railway & Light Co. have been filed. The capital stock is \$1,250,000, and the incorporators are J. J. Ransom, G. H. Higby, E. C. Walsh, A. E. Alsh and C. H. Walsh. The object of the incorporation is the ownership and operation of steam and street railroads, gas and electric-light plants, power and steam heating plants.

Chicago.—The total cost of equipping the Lake Street Elevated Railroad, Chicago, with electricity was \$294,000. Since the change in motive power, it is reported, a saving in labor alone of \$4,000 per month has been made. It is expected that as soon as the employees have become perfectly familiar with the working of the new system, a saving of \$10,000 a month will be made. As soon as the Lake Street Elevated commences using the Union Loop, it will be required to pay a toll of 10 per cent. on its gross receipts. This road is now carrying about 30,000 passengers a day and the increase in traffic due to running trains around the Loop is estimated at from 5,000 to 15,000 passengers per day, an increase of 5,000 passengers a day would more than offset the additional expense. The Lake Street Elevated received from the Union Loop Company \$441,000 for the Lake Street Extension running from Fifth avenue to Wabash avenue.

The Chicago City Railway Co. has issued \$10,000,000 5 per cent. bonds. It is stated that this is not an increase in the indebtedness of the company, but rather a consolidation of the debts. By this move a trust fund is secured to pay off the first mortgage issue now standing against the property, which does not come due until 1928.

Shamokin, Pa.—The Schuylkill Traction Co. reports its gross earnings for the year ended Sept. 30, 1896, as \$96,809, an increase of \$5,872 over the previous year; operating expenses, \$56,008, a decrease of \$1,613, and net earnings, \$50,801, an increase of \$7,441. The fixed charges for the year (interest on bonds) were \$25,000, leaving a surplus of \$15,801, an increase of \$7,551.

TRAFFIC.

Traffic Notes.

A St. Louis mill has ordered from India 1,500 tons of jute butts, to be taken by water to Galveston, Tex.

The new elevator of the W. W. Cargill Company, at Green Bay, Wis., has just been completed. It has a capacity of 500,000 bu. and is one of the best-equipped elevators in the state.

The Cleveland Leader says that the Conneaut & Port Dover car ferry is doing a successful business. The company is said to have made contracts which will give it 60 cars of coal daily all winter.

The Managers of the Joint Traffic Association have made a plan for taking into the association those companies running vessels on the lakes which are controlled by railroads in the association, and it is said that the presidents of the roads interested have practically approved the plan.

It is reported that the railroads interested in emigrant traffic from the Atlantic seaboard to points beyond the Missouri River have agreed to abolish commission to outside agents in New York City after Jan. 1. This agreement, long desired, but heretofore impossible of accomplishment, has been made possible by the improvement in the relations of the steamship lines with each other. The payment of commissions by the railroads to the steamship lines will probably be continued.

Reporters at Canton, O., estimate that during the presidential campaign, up to Nov. 1, the railroads carried to that town, in special trains, over 500,000 passengers. In addition to these, very large numbers of people went to Canton on regular trains. Most of these passengers have been carried at half rates, and some at prices much lower than that. For some time the Cleveland, Canton & Southern and the Cleveland, Terminal & Valley carried passengers from Cleveland to Canton and back, a round trip of about 120 miles, for 40 cents, equal to 3½ mills per mile; and for a week or more the rate was only 25 cents, equal to 2.1 mills per mile.

Lines are being drawn closer and closer among the local passenger and ticket agents, and it will soon be a difficult matter to deal with brokers or to cut rates without detection. A great obstacle in the prosecution of cases has been the refusal of the agent making the complaint to push the case. Many of the ticket men have kept debit and credit accounts with each other and squared their cases outside the association. Now a special solicitor has been appointed by the Western Passenger Association to conduct such cases. Chairman Caldwell has just appointed J. H. McBride to this position, in accordance with a resolution adopted by the association in September. His headquarters will be in Chicago and he will be available for the prosecution of offending ticket agents whenever called upon.—Omaha World-Herald.

Chicago Traffic Matters.

CHICAGO, Nov. 4, 1896.
Receipts and shipments of corn at Chicago this season broke the record. They were the largest in the history of this port. Lake rates on grain have fluctuated considerably during the past two months. On Aug. 31 the rate on corn, Chicago to Buffalo, was 1½ cents a bushel. The present rate is 2½ cents. The rates have gone up and down between these two figures for two months. The movement of wheat and oats by water has been very light. The wheat rate has run from 1 to 1½ cents. The highest the oat rate has gone was 2½ cents, at which rate 250,000 bushels were taken last week. The rates on package freight have been almost absolutely maintained at tariff, according to the agreement. Tramp boats have caused little trouble to the lines in the agreement. Recently a tramp contracted 5,000 tons of sugar, Chicago to New York, to go by the Erie Canal, but great trouble was experienced in securing dockage at New York and a second attempt of this kind is not likely to be made again soon.

The Board of Administration of the newly reorganized Western Freight Association has begun business with but two members—Messrs Midgley and Wellington. Mr. Parker, of the Missouri Pacific, is said to have practically accepted as one of the administrators, but he has not yet assumed the duties of the office. Mr. Fletcher and Mr. Munroe, the two other elected administrators, have declined. Two new men will be elected to fill these vacancies. The election will probably be by letter vote among the presidents. The name of A. J. Vanlandingham, Commissioner of the Kansas City Transportation Bureau, has been proposed as one of the Commissioners, but there will probably be opposition to him.

The Galveston Terminal lines have resolved to meet the Southern Pacific's competition in immigrant traffic through that port.

The Santa Fe and the Frisco have not completely severed all passenger relations, as has been reported. The latter was unable to connect with the famous limited California train. The Wabash offered to give the Santa Fe a through sleeper at Kansas City and the offer was accepted.

Eastbound shipments by lake last week were 129,444 tons, of which 121,329 tons were grain. Total all-rail shipments were 78,788 tons, compared with 80,844 tons for the preceding week, a decrease of 2,058 tons, and against 83,081 tons for the corresponding week of last year. The all-rail shipments by the different lines were:

Roads.	WEEK TO OCT. 31.		WEEK TO OCT. 24.	
	Tons.	p. c.	Tons.	p. c.
Michigan Central.....	8,250	10.5	9,023	11.2
Wabash.....	6,325	8.0	7,937	9.8
L. S. & M. S.....	10,610	13.5	8,586	10.6
Pitts., Ft. Wayne & Chicago	7,719	9.0	6,907	8.5
Baltimore & Ohio.....	9,385	11.9	9,792	12.1
Pitts., Cin., Chi. & St. Louis	9,745	12.4	8,710	10.8
Grand Trunk.....	7,058	9.0	8,720	10.8
N. Y. C. & St. L.....	7,778	9.9	8,638	10.9
Erie.....	8,226	10.4	8,807	10.9
C. C. & St. Louis.....	4,292	5.4	3,524	4.4
Totals.....	78,788	100.0	80,844	100.0

Of the above shipments, 3,527 tons were flour, 41,120 tons grain, 13,329 tons provisions, 10,027 tons dressed beef, 1,779 tons butter, 1,813 tons hides and 3,695 tons lumber.